TELEPHONE ENGINEER and MANAGEMENT

JANUARY, 1949

R v.53 1949

TULELAKE, CALIFORNIA

from Lake to Land!

Just as the legendary Phoenix bird arose from its own ashes, so modern, agricultural Tulelake emerged from the waters of the lake which gave it its name. . . .

Only a little over twenty years ago, the entire Tulelake area was covered by water. The lake was drained, and a young Western community was born. The rich lake-bottom land was homesteaded to veterans; one hundred and thirty sites to World War II veterans alone, with two hundred and forty-six more to be allotted this year.

The valley is famed for the abundance of game; each year thousands of sportsmen come to Tulelake for the deer, pheasant, duck and geese shooting.

It is entirely fitting that telephone directories for this aggressive new community should be published by General Telephone Directory Company. For just as Tulelake increased its land's productivity, so we have increased the productivity of the directories which we publish for more than 1200 cities and towns. Ours is an aggressive, hard-hitting organization. We strive to accomplish two fundamental objectives: First, to produce an attractive, accurate directory which will reflect the high standards of the Independent Telephone industry; secondly, to increase the gross advertising revenue from each directory.

Our success in accomplishing these objectives is attested to in the records of the Telephone Companies we serve.

GENERAL TELEPHONE DIRECTORY COMPANY

Eastern Office: 185 North Wabash Avenue, Chicago 1, Illinois — Telephone STate 2-5478

Western Office: Press-Telegram Building, Long Beach 12, California — Telephone 6-7221

Tech.

Only GOULD Has It!

A modern research laboratory with pilot manufacturing plant where advance-design batteries are constantly created—and proved before production.

Gould uses the Metalloscope to photograph high magnifications of the structure of cast lead connectors, posts and grid frames.

The Metalloscope, a combination high-powered microscope and camera, is helping Gould scientists find the answers to age-old lead casting problems. With it, the complex crystalline structure of lead castings has become an open book. As a result, information rapidly becoming available points the way to even stronger, electrically more efficient grid frames, posts, straps and connectors. For better batteries always, choose GOULD—FOR FIFTY YEARS THE CHOICE OF ENGINEERS.

Gould Planté—
The Aristocrat of Stationary Batteries!

GOULD

STORAGE BATTERY CORPORATION

Including the Storage Battery Division of Philco Corporation

TRENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries

IT SEEMS TO US...

Congratulations to GARLAND B. FOSCUE, Wilmette, Ill. on having his son and namesake GARLAND B. FOSCUE, JR. join him in the telephone business. Young Garland has made a name for himself in the telephone industry and assumes the position of vice president and general manager of the Consolidated Telephone Co., Florence, Ky., as a well qualified executive. Additional information on this father and son team is carried on another page of this issue.

• • •

Congratulations are also in order on the completion of 44 active years in the telephone business by WALTER DAKIN, Madison, Wisc. On January 1 he was elevated to Chairman of the Board of the Commonwealth Telephone Co. turning over the active reins of the company to recently elected president BURTON W. SAUNDERS. Walter has lived and breathed the telephone business since the day in 1905 when he started to work for the old Chicago Telephone Company. As is true with most telephone people he started at the bottom and did not stop until he reached the top. He has been active in Telephone association work and is a past president of the Independent Pioneers.

• • •

The Nixon family of Westfield, N. Y., SAM F. NIXON and S. FRED NIXON, were signally honored by the newspapers recently with a special section devoted to the conversion of the Portland (N. Y.) Telephone Company and Brocton to automatic operation. It is the fourth exchange converted by Mr. Nixon. Dedication of the exchange and the newly erected fire-resistant building housing the equipment was made by Mayor Fleming of Brocton.

• • •

The "Handbook for Telephone Men" section of our 1949 Buyer's Directory & Composite Catalog is now in the editorial works and will be a wonderful adjunct to any telephone library. It is scheduled to appear on May 15 as a section of the Directory.

The National Telephone Magazine

TELEPHONE ENGINEER and MANAGEMENT

JANUARY, 1949 VOL. 53, NUMBER 1

Editor, RAY W. SMITH • *Advertising Director,* ROY F. SMITH
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FRONT COVER: IT'S THE MILLIONTH!—Granddaughter Brenda Pace is absorbed with interest as Mr. and Mrs. William J. Pace try out the millionth Bell System Rural Telephone added since World War II. The instrument was installed on the Pace farm in Alamance County, N. C., on December 16. More than 1,000 rural telephones have been added to the Bell System every working day for the past three years . . . over three times the rate of any previous period in history.

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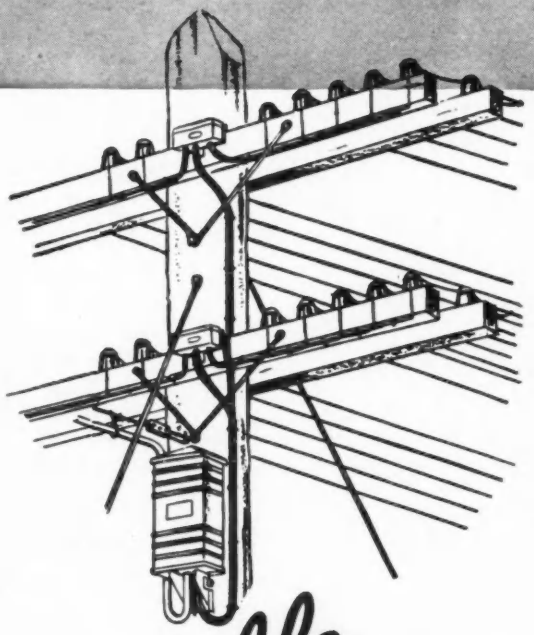
THESE FEATURES MAKE IT *Reliable*

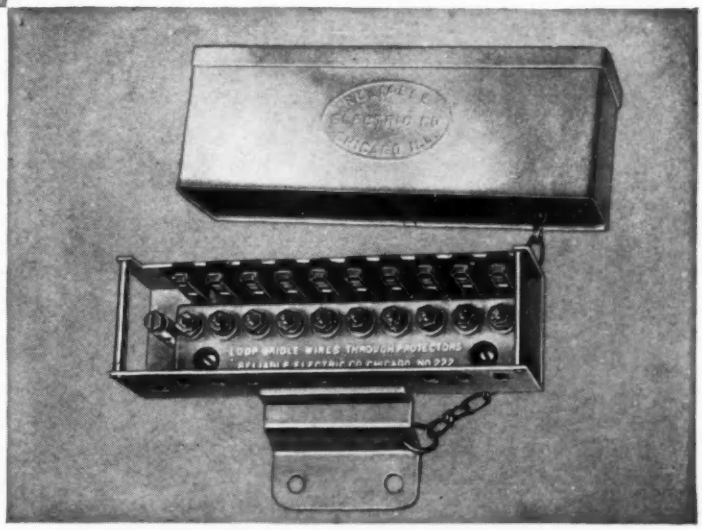
1. **Non-Corrosive Rigid Cover.**
   —Entrance slots plugged against weather and insects.
2. **Bronze Springs & Binding Posts.**
   —Permanent contact.
   —Special low absorption porcelain.
3. **Reliable Sawtooth Discharge Blocks.**
   —Self-cleaning; no dirty carbons.
   —No grounding unnecessarily.
   —Static dissipated with no time lag.

Reliable

No. 222 OUTDOOR CROSSARM ARRESTER

All these features—and more, too—mean trouble-free unprotected cable terminals, where open wire or drop wire leads are too long to be left unprotected. Design includes one-piece special low absorption porcelain, with a ten-wire capacity. Note that in addition to effectively dissipating static from exposed lines, it can be used at underground rural railroad crossings and also for protection of line repeating coils and similar work. As always, you can look to RELIABLE for these Reliable features.





Write for new Bulletin T

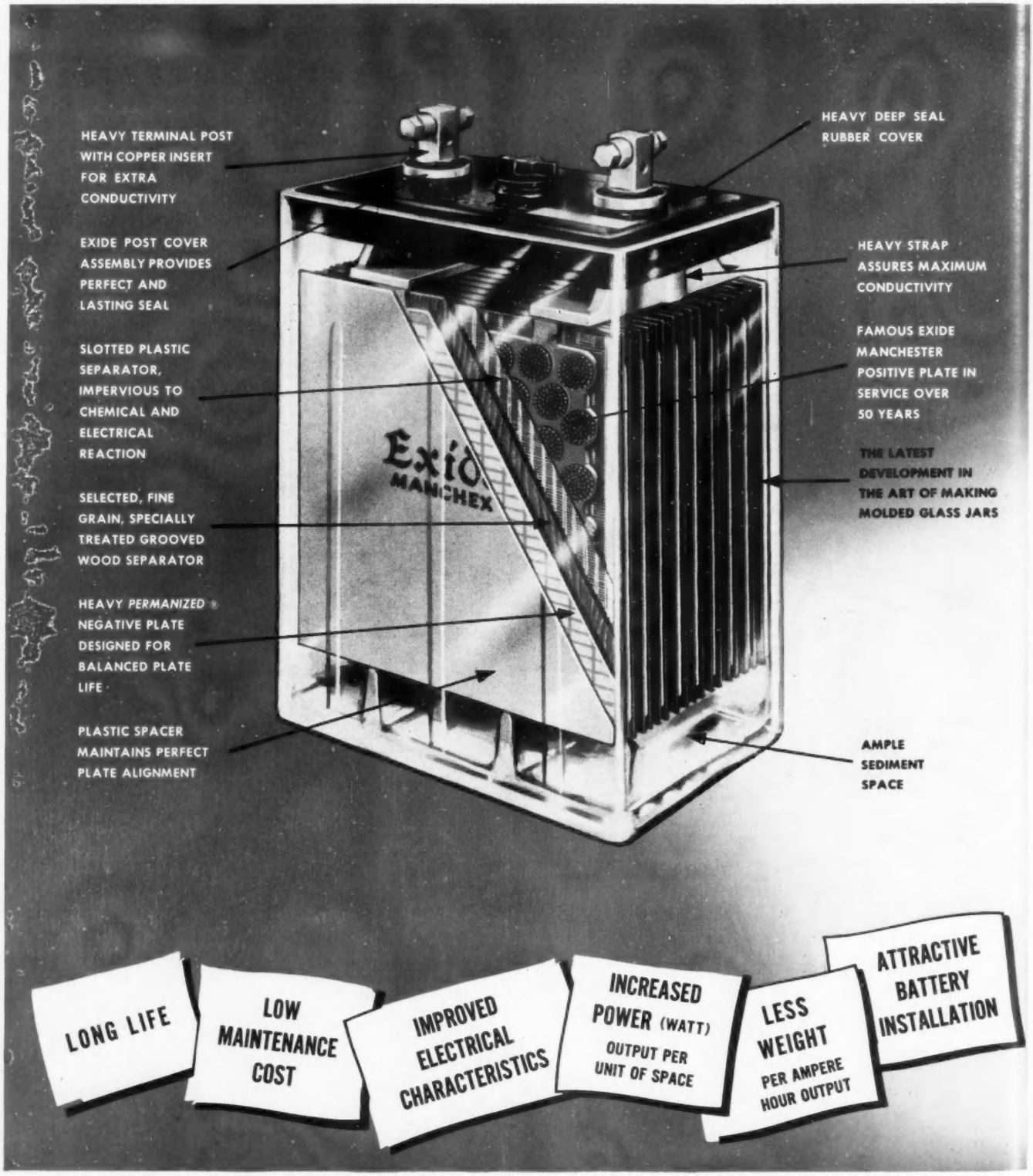
Reliable

ELECTRIC COMPANY

3145 CARROLL AVENUE • CHICAGO 12, ILLINOIS

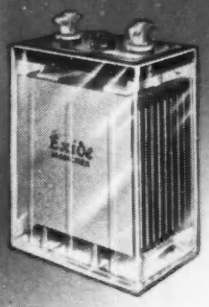
OVER 40 YEARS' *Service* TO THE TELEPHONE INDUSTRY

NEW...


HEAVY TERMINAL POST WITH COPPER INSERT FOR EXTRA CONDUCTIVITY
EXIDE POST COVER ASSEMBLY PROVIDES PERFECT AND LASTING SEAL
SLOTTED PLASTIC SEPARATOR, IMPERVIOUS TO CHEMICAL AND ELECTRICAL REACTION
SELECTED, FINE GRAIN, SPECIALLY TREATED GROOVED WOOD SEPARATOR
HEAVY *PERMANIZED* ® NEGATIVE PLATE DESIGNED FOR BALANCED PLATE LIFE
PLASTIC SPACER MAINTAINS PERFECT PLATE ALIGNMENT
HEAVY DEEP SEAL RUBBER COVER
HEAVY STRAP ASSURES MAXIMUM CONDUCTIVITY
FAMOUS EXIDE MANCHESTER POSITIVE PLATE IN SERVICE OVER 50 YEARS
THE LATEST DEVELOPMENT IN THE ART OF MAKING MOLDED GLASS JARS
AMPLE SEDIMENT SPACE
Exide
MANCHEX
LONG LIFE
LOW MAINTENANCE COST
IMPROVED ELECTRICAL CHARACTERISTICS
INCREASED POWER (WATT) OUTPUT PER UNIT OF SPACE
LESS WEIGHT PER AMPERE HOUR OUTPUT
ATTRACTIVE BATTERY INSTALLATION

the EXIDE-MANCHEX battery

Technical data about this Exide development



Ten years in the making, the advent of the Exide-Manchex Battery is based on two things—the desire to use materials to greater advantage and provide a battery that would be more efficient with greater life.

After years of research and rigorous testing, the following combination of major items that make up a storage battery was selected for use in the new Exide-Manchex.

THE MANCHESTER POSITIVE PLATES of unique lead button construction. The buttons . . . rolled strips of corrugated soft lead . . . are pressed into holes of the lead-antimony grid. Forming action expands the buttons and locks them securely in place. Only a comparatively small portion of the total lead in the button is formed initially into active material . . . the balance is available for gradual conversion in service. This button construction is an exclusive Exide feature which results in unusually long life.

THE PERMANIZED® NEGATIVE PLATES—constructed of a lead-antimony grid . . . or framework . . . with a series of vertical ribs connected by short horizontal bars. Bars are flush with plate surface . . . extend only part way through the plate . . . are staggered on opposite sides. The active material . . . sponge lead . . . is formed of vertical strips or ribbons that extend from top to bottom of the plate between the vertical ribs and is locked in place by the horizontal bars. A type that has proved its merits in every kind of stationary service . . . developed to match the long life of the manchester positive plate.

SEPARATORS—Selected fine grain, knot-free wood separators, specially treated . . . teamed with low resistance slotted plastic separators . . . assure excellent high discharge characteristics under all operating conditions.

TERMINAL POST ASSEMBLY—The design effectively seals the opening through the covers—preventing electrolyte seepage . . . heavy strap and post castings with copper inserts in the larger sizes provide low resistance electrical path from plates to terminal.

COVER—deep seal covers of tough rubber designed to give trouble-free service.

MOLDED GLASS JAR—exclusive with Exide—the most modern in the battery industry . . . strong, uniform in dimension . . . clear glass for easy inspection and maintenance . . . straight-sided for compact assembly, neat appearance.

Where to use the new Exide-Manchex Battery

The new Exide-Manchex Battery is ideally suited for all telephone battery requirements.

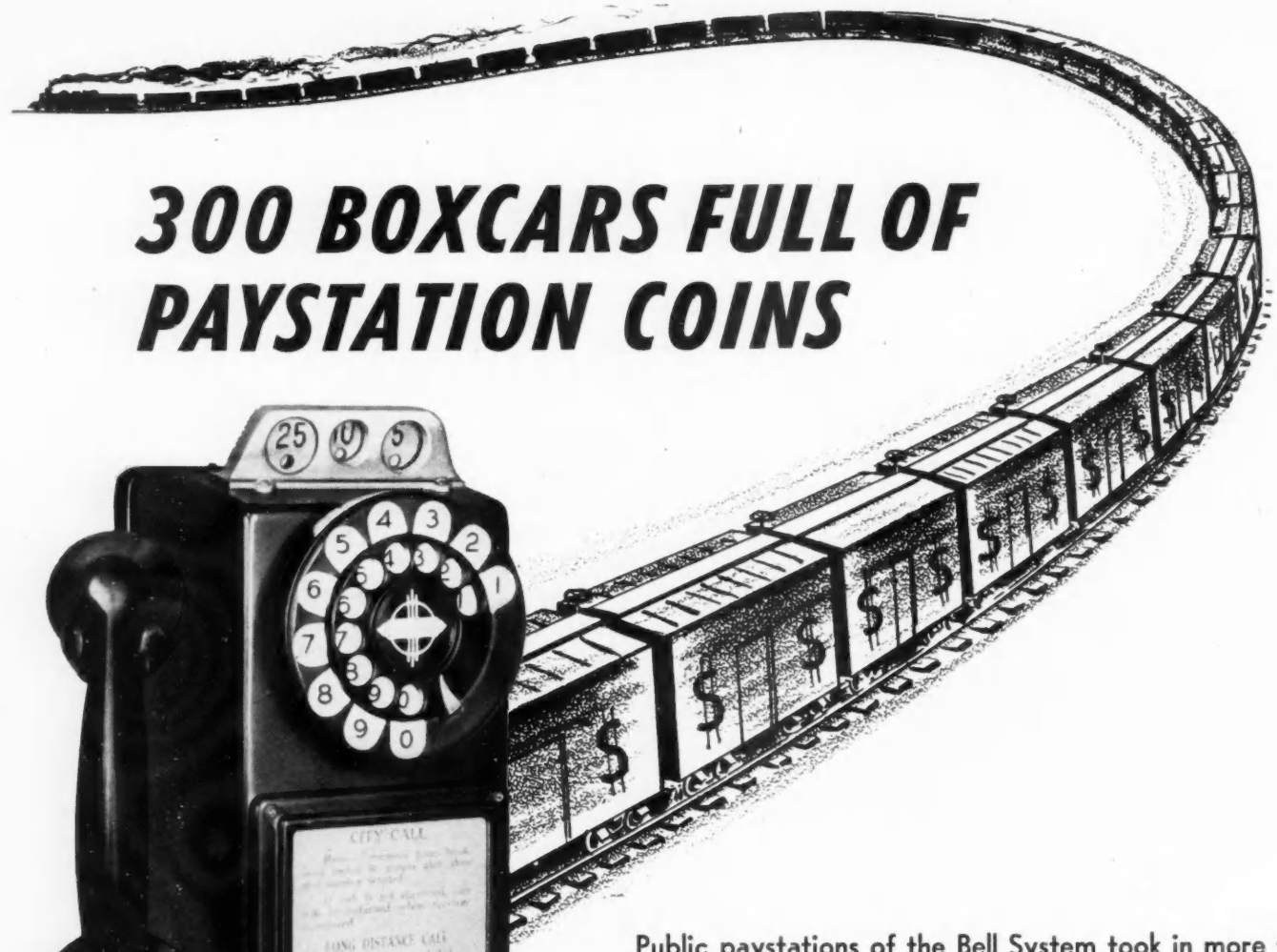
Exide®
BATTERIES

1888 . . . Dependable Batteries for 61 Years . . . 1949

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32

Exide Batteries of Canada, Limited, Toronto

300 BOXCARS FULL OF PAYSTATION COINS



Autelco-Gray "60" Series Paystations are modern, handsome, self-contained.

Public paystations of the Bell System took in more than 120 million dollars during 1947—equivalent to 300 boxcars full of nickels, dimes and quarters.* This is a striking example of the rewards that come from systematic planning in paystation promotion.

To get your share of paystation revenues—install plenty of paystations—put them in convenient locations—and direct users to them with attractive signs. Automatic Electric can supply everything you'll need!

*Bell Telephone Magazine, Spring, 1948.

AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems

Makers of Telephone, Signaling and Communication Apparatus . . Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions

AUTOMATIC ELECTRIC SALES CORPORATION, 1033 W. Van Buren St., Chicago 7, U. S. A.

Export Distributors: INTERNATIONAL AUTOMATIC ELECTRIC CORPORATION

AUTHORIZED AGENTS FOR AUTELCO-GRAY PAYSTATIONS

Automatic Electric Sales Corporation . . . Graybar Electric Company . . . Kellogg Switchboard & Supply Company . . . Leich Sales Corporation . . . The North Electric Mfg. Company . . . Stromberg-Carlson Company.

NEWSLETTER
TELEPHONE ENGINEER

Fortnightly TELEPHONE ENGINEER ★ TELEPHONE ENGINEER AND *Management*

ON THE 1st OF EACH MONTH ON THE 15th OF EACH MONTH

NEWSLETTERS *on Alternate Weeks*

Dear Sir:

January 15, 1949

Georgia Commission in recent decision refused to grant full amount of rate increase proposed by Independent telephone company because company's accounting records were not adequate. Regulatory body stated, "There is good reason for denying this application, based on the inadequate and inaccurate accounting records of the company which show no increase in fixed capital over a period of years, the investment presumably being charged to expenses..." Georgia Commission said, if such investment has been paid for out of operating expenses, it might equitably be eliminated from the rate base of the company, and future operating expenses reduced to eliminate capital charges which would work hardship on the company even to point where "service to the public would suffer." Under circumstances, Commission approved some increase in rates but increase was substantially less than amount requested.

Nature of this case, again points out necessity of Independent telephone companies maintaining adequate accounting records & thus avoiding possibility of receiving adverse treatment from regulatory bodies.

* * *

Rate adjustment applications increased at year's end & stepped-up pace continues in January. Press time roundup of rate adjustment application showed following: Illinois: Morrison Tel. Co., Montrose Mutual Tel. Co., Industry Tel. Co., Herrick Ltd. Tel. Co., Blandisville Swbd. Co., Colchester Farmers Tel. Co., Plymouth Farmers Swbd. Co....Wisconsin: Lodi Tel. Co., Westby Tel. Co., Boardman Rural Tel. Co., Elcho Tel. Co.

Meanwhile state commissions were approving favorably high percentage of applications. Recent approvals include: Alabama: Grove Hill Tel. Co., St. Clair County Tel. Co....Minnesota: Lake Crystal Tel. Co., Freeport Tel. Co., Remer Rural Tel. Co., Floodwood Tel. Co., Deer River Tel. Co., Verndale Tel. Co., Hastings Tel. Co., Minnesota Tel. Co. (International Falls)....Indiana: Bristol Tel. Co., Nappanee Tel. Co., Springport Rural Tel. Co. Inc.

* * *

Fairbanks, Alaska, is preparing for full scale entry into utilities business, according to recent AP dispatch. New York firm has offered to finance city to $4,000,000 program, which will include automatic telephone system, 3000-kilowatt power generating plant & water treatment plant. Present Fairbanks telephone system is owned and operated by the city.

* * *

Directors of Berthold (N. D.) Farmers Tel. Co. held special meeting recently to consider situation that has been worrying officials all sum-

mer. Plain facts, as released to subscribers following meeting, stated: (1) company's rates are too low; (2) revenue coming in is not sufficient to pay help and maintain lines; (3) financially the company has been barely able to meet expenses from month to month, and there is no cash reserve to meet an emergency; (4) an emergency exists and raising rates, which necessitates hearing before public service commission, and 60 day delay before increased revenue began to dribble in, would do no good at this time.

Directors stated only solution is for the subscribers to pitch in and fix up lines themselves. There is an alternative, of course, let present company go completely broke, & cease service entirely. Then organize new company, make every subscriber buy share of stock, pay off old stockholders and take over and operate property on cooperative basis. Then there would be no live stockholders to assess if funds go wrong. Directors stated -- "It would be cheaper & simpler for everyone to pitch in and do a few day's work..."

* * *

California Independent Telephone Association has scheduled mid-season, two-day association meeting at Hotel Californian, Fresno, Calif., Feb. 9-10. First day's meeting will be devoted entirely to California Public Utilities Commission matters under auspices of representatives of several commission departments will be conducted by Walter B. Wessells, commission's telephone & telegraph engineer. Second day's meeting will be discussions of general business matters affecting Independent companies; will be conducted by Richard Crowe, Lyndon Farwell & Alden Knapp.

* * *

Highlights: W. L. Bryant, dist. mgr., Arkansas Associates Tel. Co., Warrensburg, Mo., announced improvement program for Lake City and Monette, Ark.; Lake City to be converted to automatic, Monette to common battery. ...Milo R. Maltbie, chairman New York Public Service Commission, filed application for retirement, effective Jan. 22; Spencer B. Eddy slated to take over as chairman....Webster County Tel. Co., Marshfield, Mo., installing new swbd. position....Tom Leonard, pres. of Ozark Tel. Co., anannounced plans for automatic installation at Antonia, Mo....Portland Tel. Co. completes automatic cutovers at Brocton & Portland, N. Y.

Citizens Tel. Co. completed cutover of Corder, Mo., exchange to automatic operation....Battle Creek Tel. Co., Wentworth, S. D., completed line rebuilding project....Crawford Tel. Co., Girard, Kans., installed new 3-section swbd....Twelve subscribers of Mifflin & Windowville (Ia.) Tel. Co. completed rebuilding outside plant....R. Henke appointed mgr., Dakota Tel. Co., Wakonda, S. D....Central Tel. Co. announced plans for erection of $24,000 building at Lakefield, Minn....R. R. Mann appointed dist. commercial mgr., Indiana Associated Tel. Co., Connersville, Ind., will succeed E. A. Randall who will retire in August....C. W. Woodward elected pres., Kellogg (Ia.) Mutual Tel. Co.

Ray Smith

Ray W. Smith, Editor

Solve All Your Wire Problems...

Get GENERAL CABLE *communication wires and cables from* AUTOMATIC ELECTRIC

TELEPHONE CABLE
Paper Insulated
Rubber Insulated
Textile Insulated
Submarine and Armored

DROP WIRES
Rubber Insulated—Monotype
Polyethylene Insulated—Gencatel
Neoprene Insulated—Neotel

BRIDLE WIRES
Rubber or Synthetic Insulated

GROUND WIRES
Rubber or Synthetic Insulated

INSIDE WIRES
Rubber or Synthetic Insulated

CONDUIT or DUCT WIRES
Rubber or Synthetic Insulated

POTHEAD WIRE
Rubber or Synthetic Insulated

BARE LINE WIRE—Copper

LASHING WIRE—Copper

BONDING WIRE—Copper

TIE WIRES—Bare or Insulated

Fill all your communication wire and cable needs with one order. Specify General Cable and rely upon Automatic for deliveries at the earliest possible date. You get the best when you specify General Cable. You save time and money when you concentrate on one source of supply. For everything you need in communication wire and cable supplies—insist on General Cable. Check your requirements from the list and place your order today.

RECOMMENDED AND DISTRIBUTED BY

AUTOMATIC ELECTRIC SALES CORPORATION

1033 WEST VAN BUREN STREET, CHICAGO 7, ILL.

Your Subscribers need this NE

#6-2-10 SYSTEM

RECTIFILTER

TO 110-V AC LINE

SECRETARY "A" RECEIVING CALL FROM EXECUTIVE "J" ON #1 INTERCOM.

DESK A

"B" IS TALKING TO CUSTOMER ON #1 TRUNK. CALL IS ALSO SWITCHED TO INCLUDE "H" AND "J" FOR CONFERENCE PURPOSES

DESK B

"C" IS HOLDING CONFERENCE CALL ON #2 INTERCOM. WITH "E", "F" AND "G"

DESK C

"D" IS MAK PRIVATE OUT CALL ON # TRUNK

DESK

#1 TRUNK

#2 TRUNK

RELAY EQUIPMENT CABINET

DESK F

DESK G

DESK H

X = KEY-BX BOX

Y = 1000 SERIES MASTERPHONE

Select the System to Meet the Need!

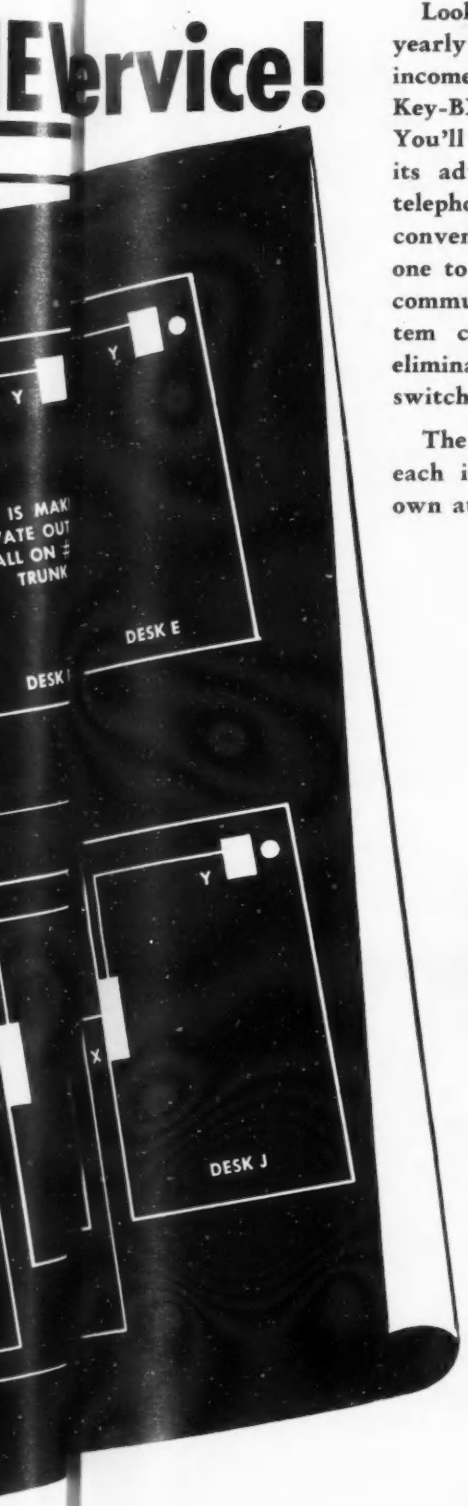
6-2-20 SYSTEM provides 6 trunks, 2 inter-communication circuits and 20 stations.

6-2-10 SYSTEM provides 6 trunks, 2 inter-communication circuits and 10 stations.

3-1-10 SYSTEM provides 3 trunks, 1 inter-communication circuit and 10 stations.

2-2-10 SYSTEM provides 2 trunks, 2 inter-communication circuits and 10 stations.

(All systems may be used with either common battery manual or dial main exchange.)



Elervice!

Look into this new plan for increasing yearly operating revenues! It boosts your income through rental of the Kellogg Key-BX equipment to business houses. You'll find that businessmen readily grasp its advantages, because it makes their telephone service far more flexible and convenient. For businesses requiring from one to six trunks and one or two inter-communication circuits, the Key-BX system constitutes a wiring plan which eliminates the need for an attended switchboard.

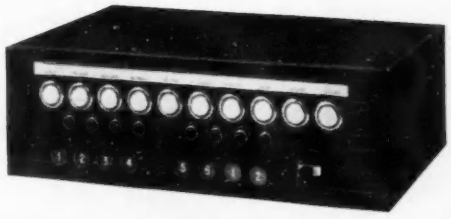
The Key-BX box sets on the desk of each individual; makes each person his own attendant. It gives him quick access to all trunks and inter-communication circuits; enables him to call any other individual at the flick of a switch. All lines clear through a relay equipment cabinet installed in the subscriber company's office.

It's a flexible system, too! Any telephone with a standard talking circuit may be used at each station. And the Kellogg Key-BX system is available in four convenient capacities. Choose the capacity that meets your individual subscriber's needs and put Key-BX to work. Ask your Kellogg representative for full details—or write for our Key-BX Book *now!*

Don't Delay—

GET THE FULL STORY ON THIS BUSINESS-BOOSTING EQUIPMENT

Today!

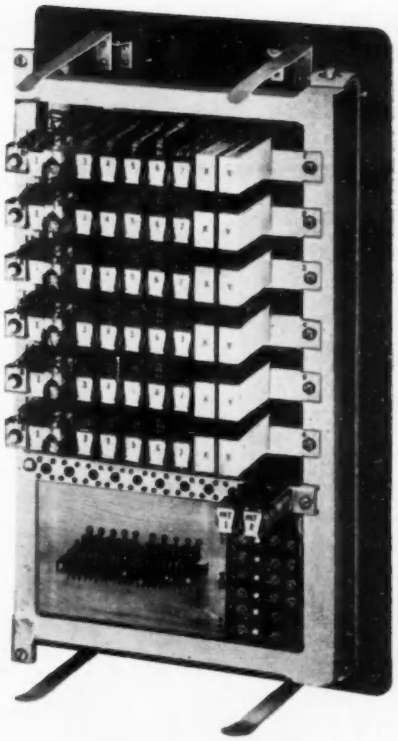


Key-BX Box

Small and compact, mounts readily on desk for use with each station. Face equipment consists of push-button locking keys with individual lamps for trunk and inter-communication circuits, a holding and release key, and selecting push-button keys for each station.

1000 Series Masterphone

An ideal companion for the Key-BX system. Easy to install, simple to maintain. Complete dependability assures subscriber approval.



Relay Equipment Cabinet

Designed for wall mounting in a convenient location in any office or business establishment. Trunk relays, and associated apparatus for each individual trunk are mounted on a single mounting plate and wired with a hand made cable which attaches to a plug also associated with the mounting plate. This arrangement of trunk equipment provides for convenience in installing additional trunk circuits when desired. Act now—get complete technical information on this equipment today!

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

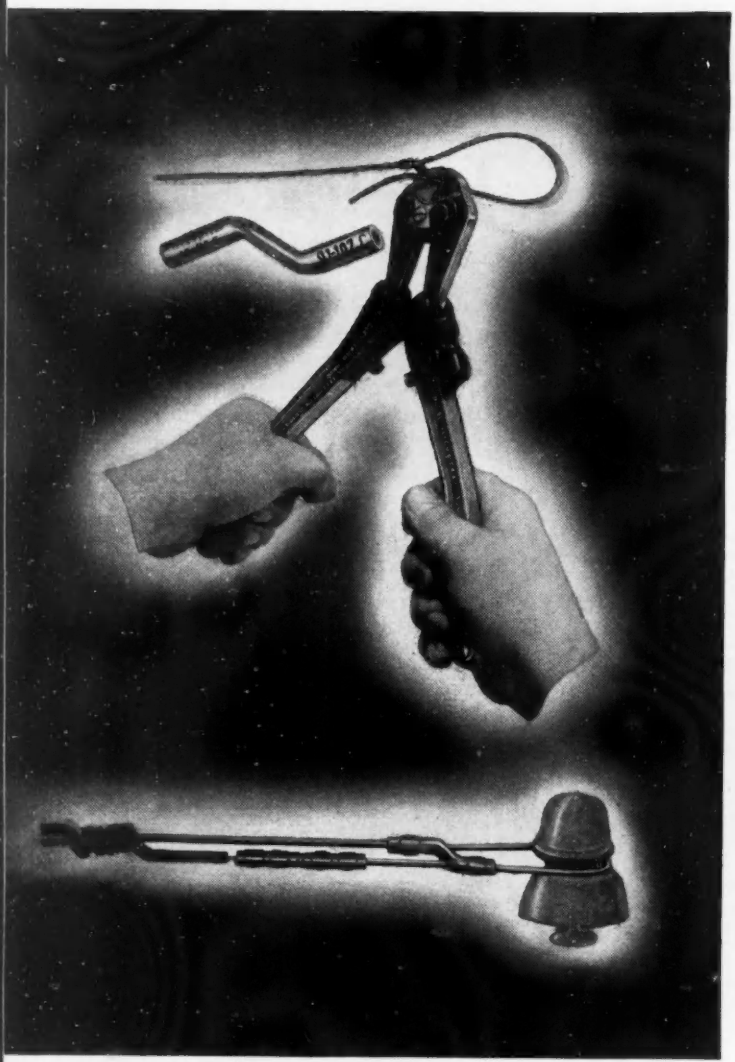
KEY-BX SYSTEM

6650 SOUTH CICERO AVENUE • CHICAGO

Successful INDEPENDENT TELEPHONE MAN Says:

C. W. BOUTIN
Southeast Missouri Telephone Co.,
Cape Girardeau, Mo.

"In our 42 years of ordering supplies from Kellogg we have had no regrets and not one disappointment."



Simple, Quick and Sure! For splicing two wires of different size, there's nothing simpler than using Nicopress Reducing Sleeves and the Nicopress Tool. Splices made this way are always tight and strong. Both tool and sleeves are made by the NATIONAL TELEPHONE SUPPLY COMPANY, and the handy sleeves come in various sizes.

Reliable . . . Economical! "Eveready" "Columbia" "Gray Label" telephone dry cells give you utmost dependability, plus definite economy through higher sustained voltage and extra days of service. Made by NATIONAL CARBON COMPANY, INC., under rigid laboratory controls. Always specify them for highest transmission efficiency at lowest cost.

for EASIER ORDERING PROMPT HANDLING QUICK SHIPMENTS

...send your next order to KELLOGG

When you order from Kellogg, you fill out just ONE order form for *all* your line supplies. Saves you time and work! Then your order gets prompt attention by experienced telephone men. No chance for slip-ups here! Finally, we ship quickly, from the distribution point nearest you. It's fast, sure service, and every item is *guaranteed!*

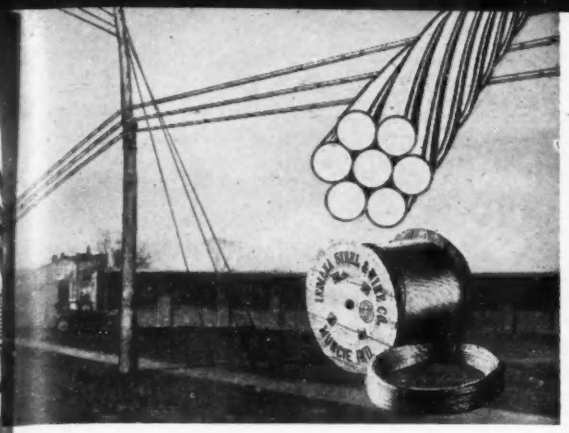
For Service from a Nearby Distribution Point, Order Your Line Supplies from

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

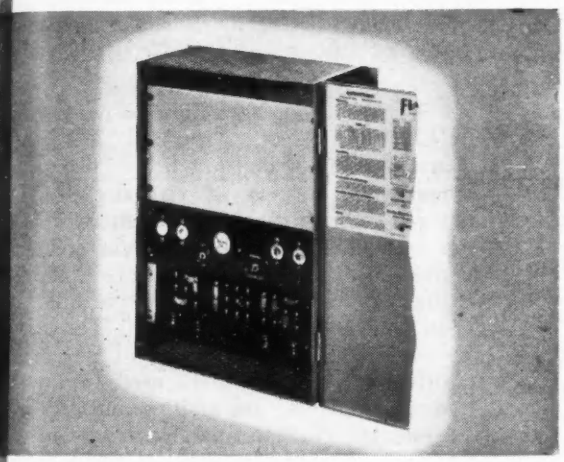
SUPPLIES

Factory and General Offices: 6650 SOUTH CICERO AVENUE, CHICAGO 38, ILL.
Branch Offices: KANSAS CITY • SAN FRANCISCO • ST. PAUL • LOS ANGELES

ALL OF THE ABOVE ITEMS MAY BE QUICKLY AND CONVENIENTLY ORDERED FR



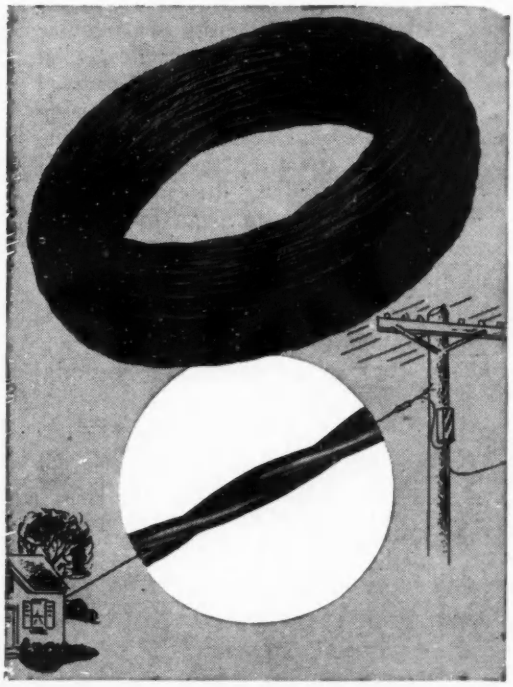
The Time-Tested Steel Strand! A heavy, ductile, tightly adherent zinc coating, applied by the famous Crapo Galvanizing Process, provides lasting protection from corrosion in Indiana Crapo Steel Strand. Made by the INDIANA STEEL & WIRE CO., its rugged strength minimizes maintenance.



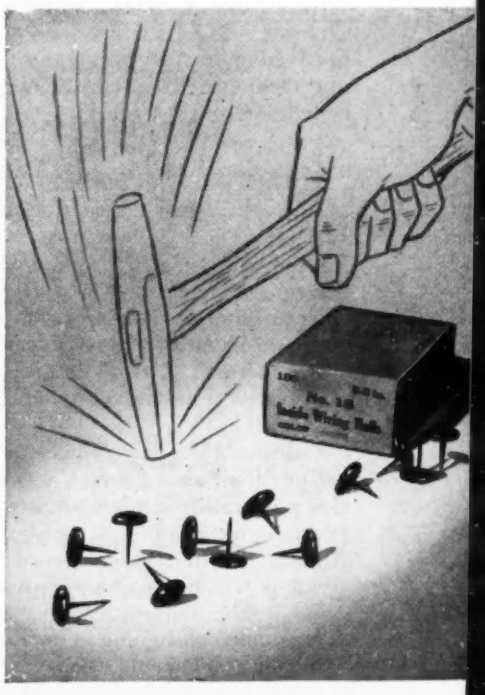
No Moving Parts to Wear! The Flotrol automatic battery charger, made by LORAIN PRODUCTS CORP., consists of a phase-splitting transformer and a dry-disc rectifier. Gives trickle charge at constant voltage. Allows for input voltage and load-changes. Write Kellogg for Bulletin No. 137 *today!*

"City of Chicago is almost utterly destroyed by fire," telegraphed Gen. Sheridan from the flame-swept city, Oct. 9, 1871. Serving through many such historical moments, Hemingray Insulators have kept pace with communications needs. Today, made by AMERICAN STRUCTURAL PRODUCTS CO., they are accepted as standard by the industry.

Sealed against Trouble! Communication equipment manufacturers demand Kester Plastic Rosin-core Solder, because it makes a perfect seal. Prevents high-resistance joints and intermittent open-and-closed circuits. Avoid trouble with KESTER SOLDER COMPANY solder.



Drop Wire Lasts 30% Longer! GENERAL INSULATED WIRE WORKS Bronze Drop Wire lasts longer because it's drawn of solid, non-corrosive bronze and covered with hard-wearing Neoprene insulation. You'll find that this drop wire is flexible and easy to handle.



Why do it the hard way? Making neat installations is *easy*—with Rhodes Wiring Nails! Designed for telephone work with quality insured by driving, bending, withdrawing and immersion tests. Made by M. M. RHODES & SONS CO., in several colors and pin-lengths.

Free Literature Department

New Product Literature of Practical Interest

All literature described in this department may be obtained by sending in the handy blank at the bottom of this page.

CABLE:—Just off the press—here's a helpful and complete guide to the selection and specification of cable for all four basic requirements of the telephone industry. Specifically, it covers Ansonia Ankoseal cables for—switchboard use; outside as aerial or in duct service; outside for direct burial; inside wiring cable.

A copy in your hands will help you determine conveniently the cable you need.—*Request FL* 242.

MAGNET CHARGER: A new 6-page folder by Radio Frequency Laboratories, Inc., illustrates and describes the Model 107 Magnet Charger. Some typical newly developed adapters for production charging of industrial magnets are illustrated.—*Request FL* 243.

MICROMAX RECORDERS:—In a 32-page illustrated catalog just issued, the Leeds & Northrup Co. lists, for the first time in one publication, their complete line of strip-chart Micromax recorders and controllers for measuring a wide variety of process variables . . . temperature, speed, gas analysis, electrolytic conductivity, pH, etc.

Called, "Micromax Model S—Indicating Recorders and Controllers", this publication gives complete specifications in convenient, tabular form. Among the indicating recorders are single-point, two-point and multiple-point instruments which measure the values detected by one or as many as 16 primary elements. Among the recording controllers are those which provide two-position control or are integral parts of full proportional control system . . . the latter either Micromax Electric Control—Position-Adjusting Type for regulating valves, vanes or dampers; Duration-Adjusting Type, primarily for electrically-heated units—or Micromax Pneumatic Control for air-actuated valves *Request FL* 244.

"99 *Questions Most Often Asked About Magnetape Twin-Trax Recorders*" is the title of a 12-page 6 x 9 booklet, prepared by the Engineering Department of Amplifier Corp. of America. Compiled from an analysis of over 5,000 letters received by the engineering department of this company, the booklet lists everyday questions, and their answers, on the performance, construction, specifications, and availability of Amplifier Corp. of America's newly developed series of Twin-Trax dual-channel magnetic tape recorders. Following the title page, which calls to the reader's attention the purpose of this compilation, the rest of the booklet devotes a page to each of eleven general topics such as General Theory of Twin-Trax Recorders; Tape Handling Mechanisms; Performance Data; Operating Facilities; Special Applications, etc.—*Request FL* 245.

SOLDER: Alpha Metals, Inc., has issued a condensed catalog featuring a comprehensive solder selection guide, which lists the 16 metals that are most frequently soldered. The pertinent information given about the metals includes their order of solderability together with recommendations for the best flux core solder or solder and flux suitable to soldering operations, and also for the flux type most desirable when an external flux is used. Other tables list the physical characteristics of the various Alpha solders.—*Request FL* 246.

TESTER:— New Bulletin on the Dillon Model L Universal Tester brings valuable and practicable information to testers of virtually any type of material from fabrics to strong metals used in industrial production. It does much more than illustrate and describe the portable Dillon Model "L" Universal Tester—a precision instrument of seven different ranges, widely used in industrial plants, universities and laboratories, for testing materials of tensile strength from a few pounds to 160,000 pounds.—*Request FL* 247.

WOOD PRESERVATIVE:—A new bulletin telling the story of wood decay has been issued by the Chapman Chemical Co. Titled "*Protecting Your Investment in Wood*", this brochure explains how and why decay occurs, and shows treating methods with Chapman Penta Preservative to prevent this loss. Treating plants and all wood users will be interested in this informative bulletin.—*Request FL* 248.

TELEPHONE ENGINEER PUBLISHING CORP.
7720 North Sheridan Road
Chicao 26, Illinois

Please forward the following literature described in the Free Literature Department of the January, 1949 issue of TELEPHONE ENGINEER AND MANAGEMENT: (Check information desired)

FL 242.....FL 243.....FL 244.....FL 245.....

FL 246.....FL 247.....FL 248.....

Name ..... Tit'e .....

Company: ....

Street Address: .....

Town: ..... Zone:..... State:.....

Federal's New Selling Plan

WITH PUBLISHED PRICES

. . . A 3-point program that will greatly simplify the supply problem of the telephone industry

FEDERAL, always a leader in the development of better telephone equipment, now is inaugurating a new and different selling plan—a 3-point program that makes the purchase of urgently needed equipment more economical, easier and faster than ever before. Here are the three important features of the New Selling Plan:

1 SUBSTANTIAL PRICE REDUCTIONS

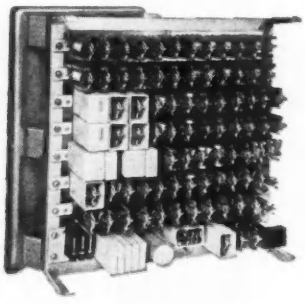
Because of Federal's large productive facilities, modern mass production methods, and now with the low selling cost under this new plan, Federal will announce substantial price reductions for those products which are being manufactured on a quantity basis.

2 NEW METHOD OF PURCHASE

Equipment offered under this plan will be shipped on a 60-day trial basis if desired, so that you may make your own or a customer test of its performance. This period is even sufficient to prove the revenue-producing possibilities through a 30-day billing cycle. If your tests are not completely satisfactory, the equipment may be returned at our expense—and no charge will be made.

3 QUICK DELIVERIES

For the most part, the equipment included in this plan will be offered for immediate delivery—direct from factory stock. Even if the initial demand exceeds the supply, deliveries should be completed in the matter of a few weeks.



THE FIRST PRODUCT OFFERED UNDER THIS PLAN AND NOW READY FOR IMMEDIATE DELIVERY IS

Federal's 6E PABX

— AT A SAVING OF 16.7 PER CENT —
REDUCED FROM $593 TO $494

6E PABX for Small Business and Large Residence—2 Central Office Trunks, 6 Stations, 1 Local Link

The following associated equipment is available if required to complete your installation:

Federal 3365 AS Battery Eliminator—functions as power supply and filter	$112.00
Spare Parts	6.50
Set of Prints, Maintenance Instructions, Method of Operation Sheets	No Charge
Federal 803 BQ push button type subscriber set, equipped with Western Electric Transmitter and Receiver capsules, less dial	$ 19.75
Same set as above with Federal U802A Dial	25.40
Relay Maintenance Tools	19.30

Any other conventional type of push button subscriber set, dial or battery eliminator would be satisfactory should you have such items already available, or prefer to obtain them from other sources for plant standardization reasons. The push button type set will not be required if a telephone with an externally mounted push button, as in the simplest wiring plan, is used.

All of the above prices include domestic packing and prepaid delivery to any point in the United States.

Act Now! Profit by this new direct-to-customer supply plan. For complete descriptive literature covering Federal's 6E PABX, write to Telephone Sales Department.

DETROIT PUBLIC LIBRARY

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Federal Telephone and Radio Corporation

100 KINGSLAND ROAD, CLIFTON, NEW JERSEY

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Phillips products, distributed through the globe-girdling organization of the International AUTOMATIC ELECTRIC Group, have earned a world-wide reputation for quality. Behind every reel of Phillips Cable, every roll of Phillips wire, is half a century of experience in meeting the exacting demands of the communication and electrical industries.

Telephone companies and operating administrations in all parts of the world look to International AUTOMATIC ELECTRIC Corporation for Phillips quality wires and cables. We shall be glad to serve you, too.

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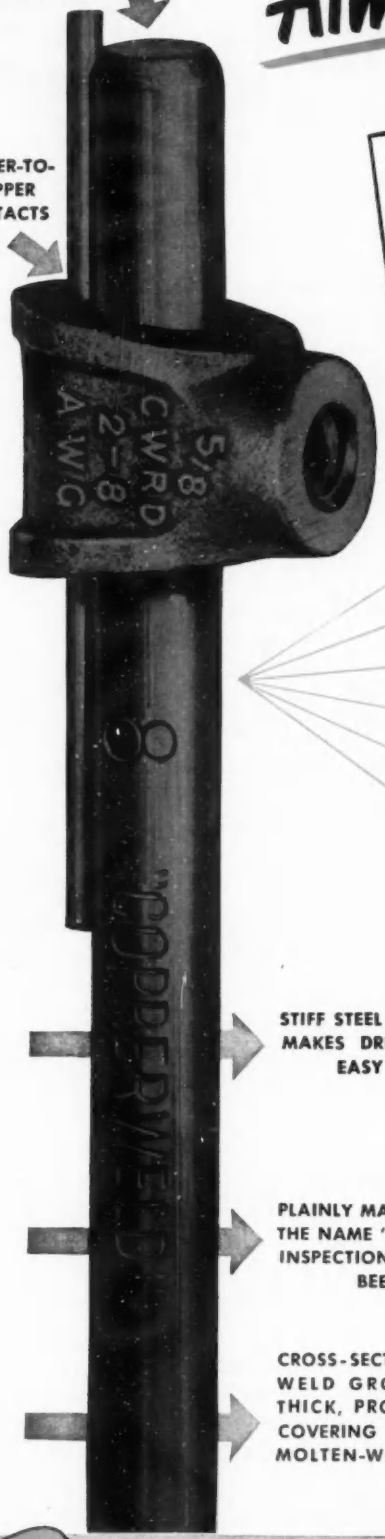

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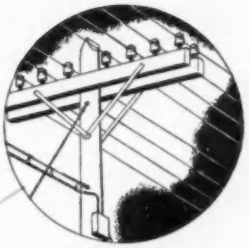

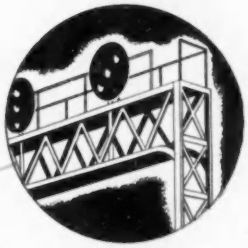

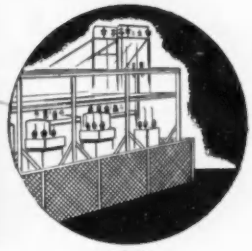

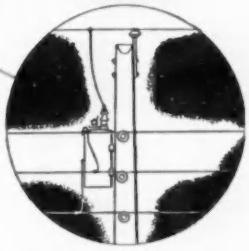

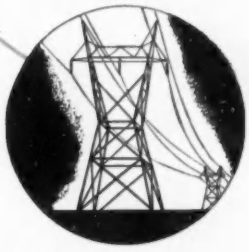

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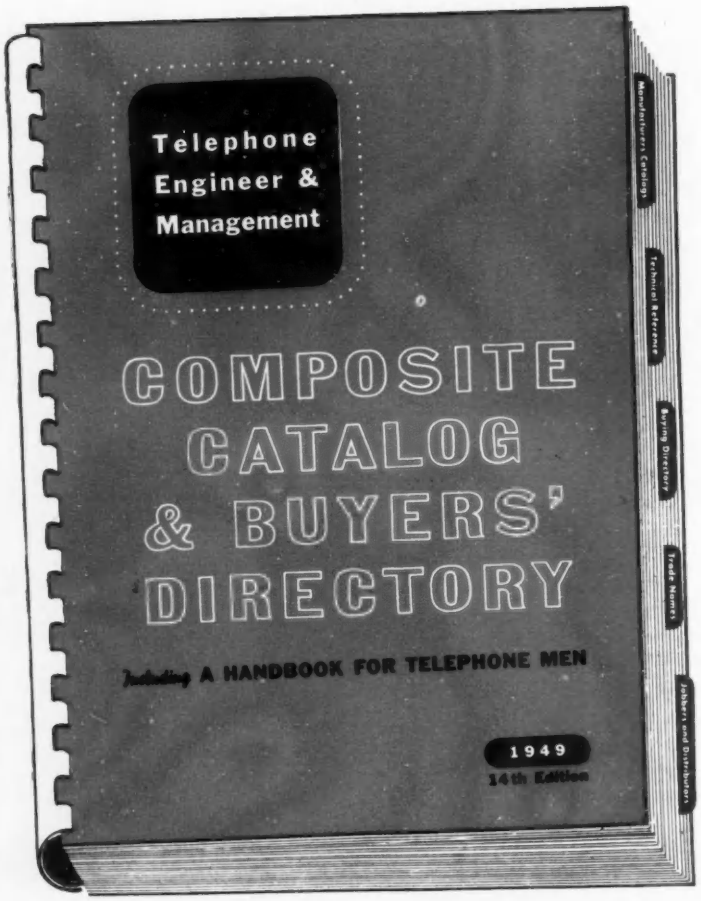
We Accept the Challenge!

"It took a lot of ability, imagination and fortitude to put out the excellent Buyers' Directory and Composite Catalog which you folks did on your 13th annual edition. The setup is very fine indeed, and your promise to have a better one next year (1949) and each succeeding year is really going to call for a lot of hard work.

Congratulations on an excellent job."

(Signature upon request)



The above paragraphs taken from one of the many congratulatory letters received following publication of the 1948 Telephone Buyers' Directory & Composite Catalog were taken as a challenge by our editorial staff.

As a Result . . . .

Several important improvements are already planned for the coming 1949 issue.

1. A number of items developed in recent months and needed in the telephone business will appear in the 1949 Buyers' Directory.

2. The Composite Catalog will contain many more pages showing comparative values of equipment and supplies.

3. "A Handbook for Telephone Men" introduced in the 1948 Directory-Catalog and not available elswhere met with such popular favor it will be enlarged upon in the 1949 issue. Approximately 50 pages of Questions and Answers to problems constantly faced by telephone men will make this Handbook section a daily needed reference manual.

Our Goal! **A Telephone Buyers' Directory & Composite Catalog for every buyer of telephone equipment and supplies in the Western Hemisphere. If you failed to receive a 1948 issue please write for a copy today and we will send one to you by return mail. If you need more than one copy of the 1949 issue please advise us immediately as we will be going to press within the next 30 days.**

EDITORIAL

The "High Profits" of the Telephone Business

THERE is a considerable amount of loose talk about what many uninformed people consider to be high profits of business. Unfortunately, many of these critics fail to distinguish between profits in amounts of dollars and profits in terms of percentages on investment, or on sales.

There may be some who believe that, because the telephone business takes in a lot of dollars in the course of a year, its profits are high. We believe a few figures on that subject would be illuminating to any who think that way.

Here are some profit facts about the Class A and Class B Independent telephone companies of the country. These are of course the larger Independent companies, all with average operating revenues of $50,000 or more per year. There were 281 such companies in 1947.

These figures show not only that the rate of profit made by these companies is low, but also that this rate has actually been diminishing for a number of years.

In the year 1930—the earliest year for which this data is available—the then Class A and B Independent companies earned for fixed charges, dividends and surplus an average of $10.61 per company-owned station. This was about 5.8% on their investment in telephone plant, as such investment was shown by their books. (This was not a depression year for telephone companies; they did not begin to feel the effects of the depression until 1931.)

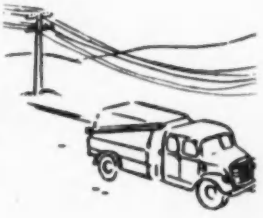
The year 1937 was a sort of average year after the great depression and before World War Two. In 1937 the then Class A and B Independent telephone companies earned an average of $9.56 per company-owned station for fixed charges, dividends and surplus. This was about 5% on their book investment in telephone plant.

In the year 1947, the then Class A and B Independent telephone companies earned an average of $6.85 per company-owned station for fixed charges, dividends and surplus. This was about 4.3% on their book investment in telephone plant. And that year, 1947, was a year in which the telephone plant was used as nearly to capacity as it has ever been used, with the consequence that the book investment per telephone in service was smaller than in preceding years.

These figures show not only that there is no "high profit" in the telephone business, but also that the increases of telephone rates to meet high present-day costs has lagged, in the Independent telephone field, well behind the increases of costs. Since 1940, in fact, net earnings per telephone of these companies has been dropping year by year. The extent to which rate increases made in 1948 will have corrected that trend will not be known, of course, until after the results have been summarized.

All facts available now indicate that many further rate increases will be necessary to assure Class A and B Independent telephone companies a rate of net earnings which will allow them to continue to expand and meet the demands of their public for telephone service.

It is worthy of note that during the period reviewed herein—from the beginning of 1930 to the end of 1947, and a period including both the great depression and World War Two—some 15 million telephones were added to the nation's telephone plant; an increase from near 20 million telephones to near 35 million.



It is also worthy of note that, during this period, the credit of the telephone industry has been maintained at a high level. This is largely because the telephone business is a stable business. But it is not a high-profit business and, at present, it is in need of higher exchange rates at many places, in order to maintain its stability.

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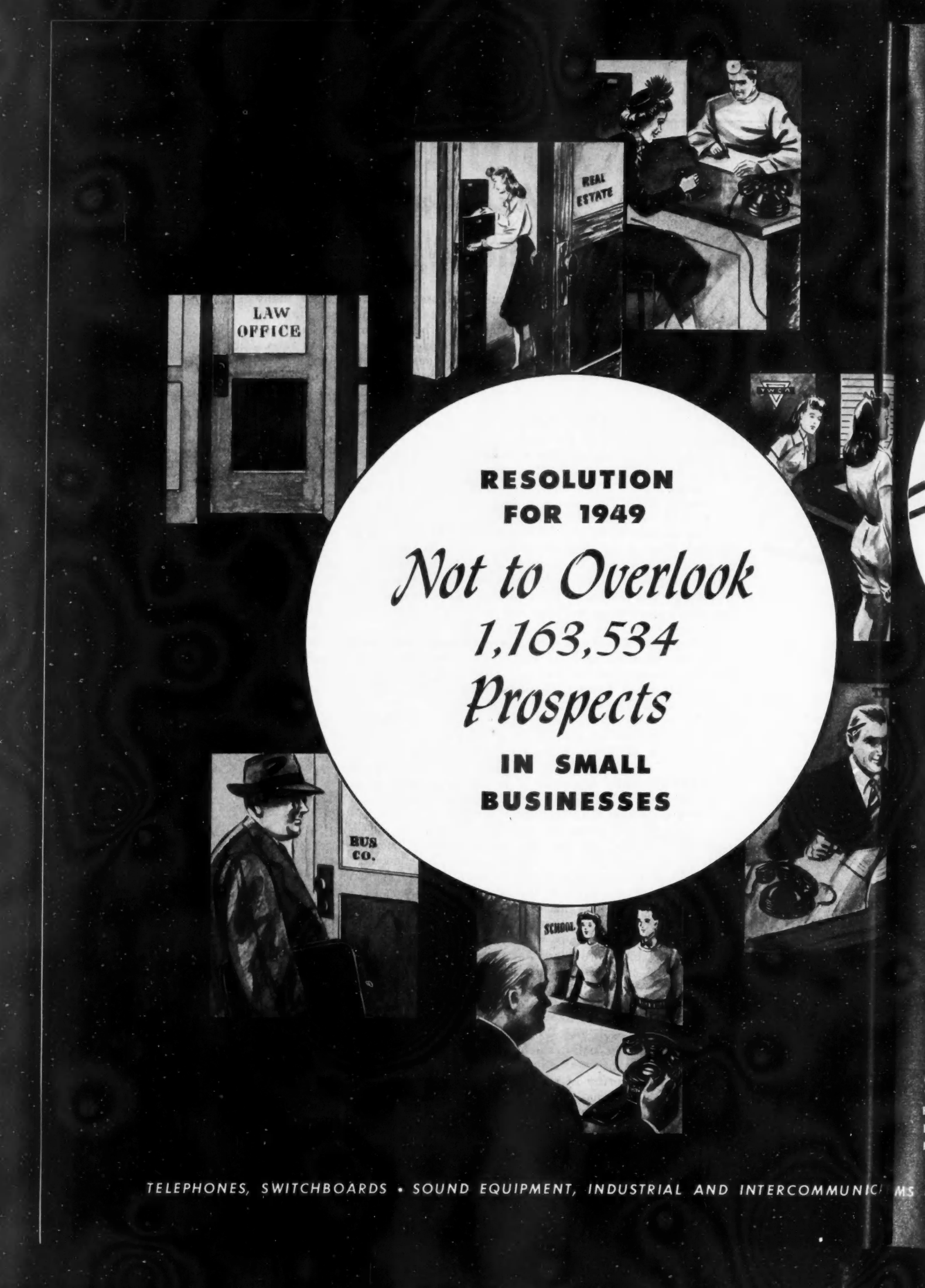

TELEPHONES, SWITCHBOARDS • SOUND EQUIPMENT, INDUSTRIAL AND INTERCOMMUNICATIONS

EVEN a cursory count, taken from the country's best-known business directory, adds up to more than a million trade and professional prospects for the type of equipment described below—at least 20% of them in the fields served by the independent telephone industry. From banks to bus companies, from architects' offices to real estate agencies, from shipping firms to schools, possible customers are legion. Any business which has multiple personnel but isn't large enough for a P.B.X. is open to suggestion. We'd be glad to send you a list of likely prospects—just write to Stromberg-Carlson and request it.

STROMBERG-CARLSON CONVENIENCE SYSTEMS

Providing 2 or 3 trunk lines (Central Office), a "Hold" key and from 6 to 10 keys for direct connection to other phones. Common talking and selective ringing are arranged on all models; "secret service" is possible, too. 24-hour service both for intercommunication and Central Office. Consult your Stromberg-Carlson representative for full details.

MULTIPLE LINE KEY TURRET EQUIPMENT

Enables *one* person to answer from 3 to 9 telephones from one desk. Especially suited for small businesses with a large number of incoming calls but not requiring a large "Order Switchboard." Calls may be held on one line while others are answered or placed. A common talking circuit and associated signaling equipment provide for transferring calls. For full details, see your Stromberg-Carlson representative.

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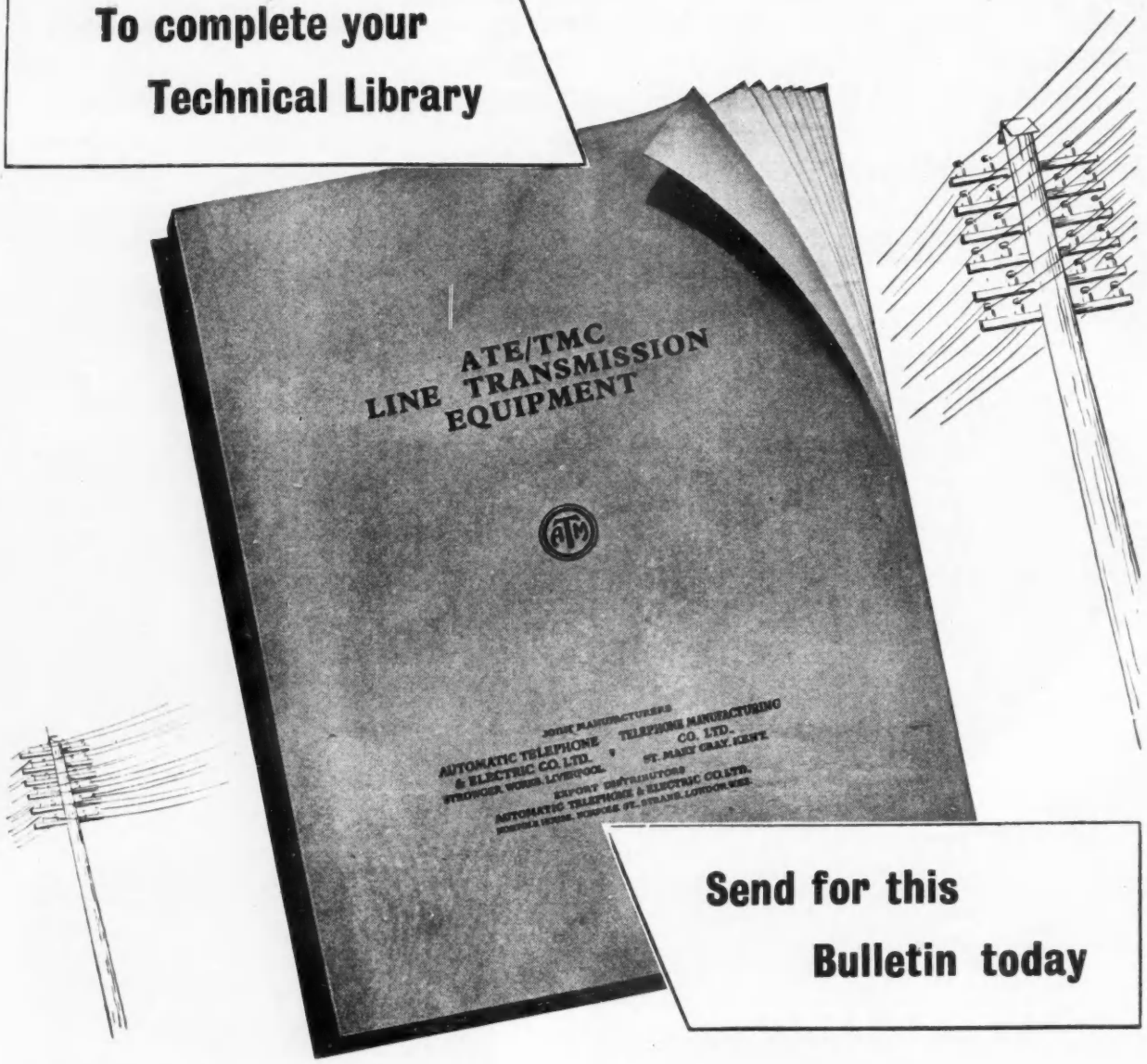
To complete your Technical Library



Send for this Bulletin today

This latest ATE/TMC technical loose-leaf bulletin, No. 1097, describes the transmission apparatus and equipment jointly designed and manufactured by Automatic Telephone & Electric Co. Ltd., and Telephone Manufacturing Co. Ltd.

The bulletin is divided into sections under the following headings:—CARRIER TELEPHONE EQUIPMENT, describing single channel and multi-channel equipment for cable or open wire lines, line matching transformer unit, and by-pass unit; V.F. AMPLIFIER EQUIPMENT, two-wire and four-wire types; V.F. TELEGRAPH EQUIPMENT, six, twelve, eighteen and twenty-four channels; SIGNALLING EQUIPMENT, including 17 c/s ringing repeater, V.F. signalling equipment and 500/20 c!s composite signal generator; and MISCELLANEOUS, describing the secraphone, compandor and disconnection locator.

Transmission engineers are requested to write for their copy of this bulletin today.

ATE/TMC *line transmission equipment*

AUTOMATIC TELEPHONE & ELECTRIC CO. LTD., Export Dept., Norfolk House, Norfolk Street, London, W.C.2. Distributing Organization for the Manufacturers:—Automatic Telephone & Electric Co. Ltd., Strowger Works, Liverpool, 7. Telephone Manufacturing Co. Ltd., London and St. Mary Cray, England.

A8241-B62

NEWS BRIEFS

Harlan, Iowa, Returns To One Telephone System

Residents of Harlan, Iowa are adjusting themselves to the idea of having just one telephone system for the first time in 25 years.

The Iowa State Telephone Co. which operated one of the two systems in Harlan, lost its request for a new 25-year franchise by a five to one majority in the recent general election.

Although there was no open rivalry between the Iowa State and the Farmers Mutual Telephone Co., it was impossible to call a person in the same town unless both parties subscribed to the same system.

The Farmers Mutual Company, which serves surrounding towns without toll charges, was granted a new 25-year franchise last March. The Iowa State franchise expires next April.

Nappanee, (Ind.) Telephone Co. Commemorates 50th Anniversary

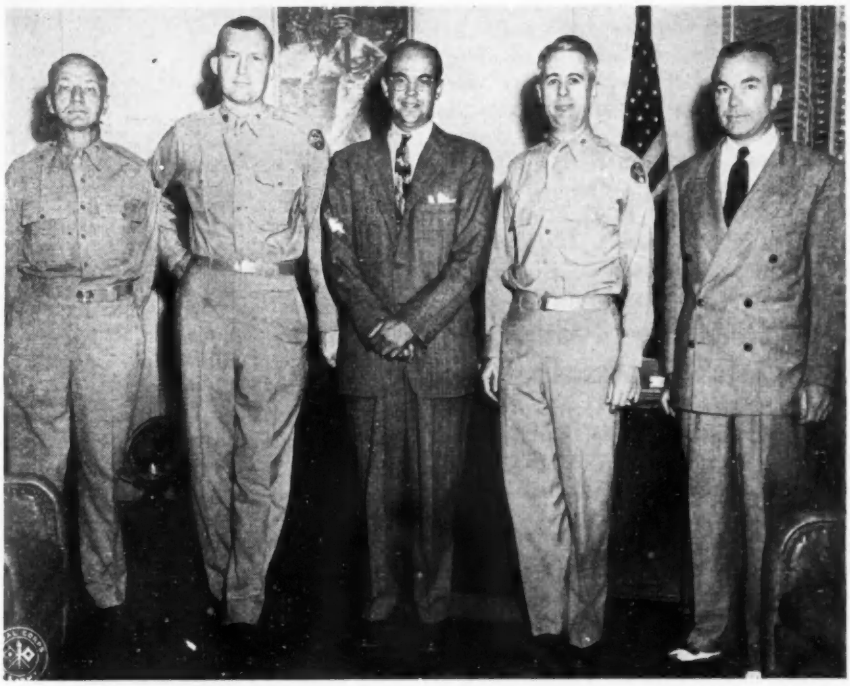
December 17 and 18 were gala days in the annals of the Nappanee, (Ind.) Telephone Co. On those days employees of the company extended a welcome to the public in the form of an "Open House."

LaMar Stoops, manager of the company, stated there were several features of an entertaining and instructive nature on the program including a tour of the office to allow guests to see Nappanee's nerve center of communications in action. Special features included hearing and seeing one's own voice, a photographic exhibit depicting the history and growth of the company from its first switchboard down to the present time, and a short movie showing in a fascinating way the complexities of completing telephone calls.

Another added attraction was a demonstration of mobile telephone service with calls made to a mobile telephone recently installed in the company's service truck.

Claude R. Stoops, at the time a jeweler operating in a corner of his father's bakery, founded the Nappanee Telephone Co. in the year 1898. Telephone service was initiated on August 15th of that year with 53 subscribers comprising the first directory list. In 1912 the founder disposed of his jewelry store and devoted his time exclusively to the telephone business up to the time of his death in 1935. Today the business is being carried on by sons of the founder, LaMar Stoops, general manager, and Donald Stoops, commercial manager.

The Nappanee Telephone Co. has grown from its original 53 subscribers to an exchange serving 1,500 telephones today, over 500 of that total having been installed since 1940. The exchange is currently completing nearly 8,000 local calls and 600 toll calls per day.



L. to R.—Lt. Colonel Edwin A. Redding, Lt. Colonel Harold Mc D. Brown, Theodore S. Gary of Automatic Electric Co., Chicago, Colonel Carl H. Hatch, and J. R. Reed, general manager, Automatic Electric Sales Corp., of Honolulu, during recent tour of Signal Communication installations on the island of Oahu, by Mr. Reed and Mr. Gary.

William Dring Purchases Klondike (Ind.) Telephone Co.

Victor and Grover Schalliol have sold the Klondike (Ind.) Telephone Co. to Mr. and Mrs. William Dring of Chicago. The new owners have also purchased ground, and are laying the foundation for a new exchange building.

The Klondike exchange was started in 1902 by the Schalliol brothers' father, August, and Frank Brown.

Brighton (Ia.) Telephone Co. Moves Into New Home

The Brighton (Ia.) Mutual Telephone Co. has moved from the building where it had been housed for 40 years to property which the company bought some time ago.

After delay because of scarcity of materials, the building has been remodeled and extensive repairs made. It has been arranged to include a main office which contains the switchboard, a director's room, a secretary-treasurer's room, and a utility and storage room.

The telephone system was first or-

ganized and owned by G. W. Smith. He had it from 1900 to 1905 when the Mutual company bought him out and moved the office from its location at that time to what is now the Ross Laine property. Dr. M. C. Terry was the president of the company.

In 1911 Kenneth Elmore was elected manager and lineman, a position he held for 32 years, until he resigned in 1943. Paul Rynor was elected to succeed him.

At the present time there are almost 500 telephones in operation out of the exchange.

Officers today include, T. B. Davison, president; L. E. White, vice president; Margaret Rynor, secretary-treasurer.

Directors listed are, K. M. Elmore, Andy Farrier, L. E. White, Joe Kessel, L. A. Horton, T. B. Davison, J. M. Stone, Lloyd Luers, H. C. Kyle, and Henry Mannhardt.

Organization Changes Made By San Angelo Telephone Co.

John E. Robbins, Jr., former head of the traffic department for San Angelo (Texas) Telephone Co., has been named head of the commercial department according to announcement made by Don Hunsaker, president.

Three other top promotions were announced by Hunsaker, who named J. J. Clay, former plant superintendent, as assistant to the president; Herman McLaughin, assistant plant superintendent, as plant superintendent, and J. H. Warren, general auditor, as secretary of the company.

Announcement of the promotions was made following the resignation of E. L. Jones, general manager. Mr. Jones plans to devote his time to private interests.

Northwestern Bell Advances A. F. Jacobson

A. F. Jacobson, has been appointed general manager of the Northwestern Bell Telephone Co. for Nebraska and South Dakota, Fred R. Kappel, vice-president, recently announced. He succeeds Will R. Johnson, who died November 19.

While attending the University of Nebraska, Mr. Jacobson started his telephone career during summer vacation as a clerk in the general offices of the company in Omaha in 1922.

Mr. Jacobson was commercial engineer for Minnesota in 1936 and 1937 and was district commercial manager in Sioux Falls in 1938 and 1939, and held a similar position in Minneapolis from 1940 to 1943.

He returned to Omaha in 1943 and held various positions in the general offices of the company, including assistant vice-president of operations from 1945 to 1946. Since then he has been assistant to the president in charge of rate and regulatory matters.

Although Chief Engineers' Committee of the General Telephone System met in Chicago in December, members discarded coats in favor of "shirt sleeves." L. to R.—E. C. Roys; W. O. Trettin, Springfield; Fred Norris; H. E. Hussey, Lafayette; Dean Barnes, Santa Monica, Calif., and C. E. Jones, Erie, Pa.

17,000th Bloomington Telephone Installed

The Illinois Telephone Co. on December 10 installed its 17,000th telephone in the Bloomington-Normal area, at the home of Mr. and Mrs. Gordon Carlson.

The installation represented a net gain of 5,500 since December 1, 1938—a 10 year period. Since the end of World War II, telephones in use have showed a net gain of 85 per month.

The exchange has a backlog of 383 telephone orders, however, in about 60 percent of the cases, cable extensions will be necessary before telephones can be installed. The company hopes to be even with the demand by summer.

With 17,000 telephones in use in a community numbering 40,000 residents, Bloomington-Normal ranks among the nation's top cities in telephone service per capita.

T. H. Moran Elected Gen. Mgr. Of Commonwealth Tel. Co.

Effective as of January 1, 1949, T. Holden Moran now secretary and treasurer of the Indiana, Michigan, and Kentucky subsidiaries of General Telephone Corp., was elected a vice president and designated general manager of Commonwealth Telephone Co., the principal operating subsidiary of General Telephone Corp. in Wisconsin. Mr. Moran will make his headquarters at Madison, Wisconsin, where he will have a complete departmentalized staff for the operations of the company.

Mr. Moran thus returns to the company with which he started his business career in June, 1928. For nine years he was employed in various departments of Commonwealth Telephone Co., learning different phases of the telephone business. In June, 1937 he became assistant connecting company agent and, in general, acted as assistant to E. M. Blakeslee in his various responsibilities as vice president of the five companies of the system whose headquarters were then located in Madison. In August, 1942 he went into the Signal Corps of the United States Army, and had extensive experience in the India-China theater, over "the Hump" with the rank of captain.

Upon his return from service in February, 1946, Mr. Moran was elected to his present position of secretary and treasurer of the East Central companies of the General Telephone System, with headquarters in Lafayette, Indiana.

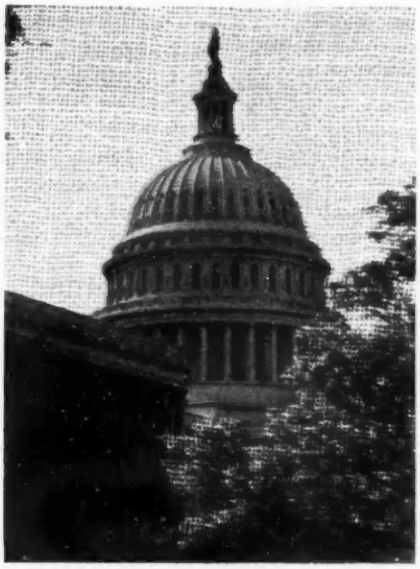
$75,000 Building Project For Walden, New York

Construction of the new $75,000 home office building of the Walden (N. Y.) Telephone Co. was recently started.

The telephone structure will measure 60 by 48 feet. It will be of poured concrete, with some concrete block, and will have a brick veneer finish. The structure will be completely fireproof.

The building will have storage and equipment rooms in the basement. On the main floor there will be the commercial offices, operating rooms,

(Please turn to page 54)



Washington Bureau REPORTS

BY ROLAND DAVIES and FRED HENCK

TO HARD-PRESSED telephone officials trying to get along on prewar rates or increases that are only a fraction of the rise in wage and equipment costs, the three-year postwar effort to gain more adequate rates has produced at least one reason for rejoicing.

Gradually, in states in almost every section of the country, another body of legal precedents and judicial decisions is being built up to support the thesis laid down by Supreme Court Justice Cardozo years ago—that holding out the hope of better things to come is no remedy for present confiscation.

State commissions which have rejected or reduced telephone rate increase applications—generally those of the Bell System, affecting a larger group of the public and more susceptible to wide publicity—generally have disallowed various items of actual expense on the ground that the holding company should pay them from its stockholders' pockets, or in line with the belief that things will get better when the current period of expansion and high costs settles down to something closer to what we like to think of as normal.

Thus far, no court has upset the view of the Bell System companies, buttressed by many judicial decisions, that expenses incurred by a prudent and responsible management in the course of the business should be taken into account 100% in fixing rates.

Two courts in Southern states are the latest to uphold this view of the Bell System companies. In one state, Tennessee, the commission was the first to turn down in its entirety a postwar rate increase sought by a Bell System company. In the other, Georgia, the commission initially cut down the company's rate increase to about 40% of the amount sought. After this order was disallowed in a series of court decisions going up to the state's highest tribunal, and Southern Bell was allowed to put its full increase in effect, hearings were held on a permanent rate boost for the company. After seven months without action, the company went to court to seek a rule permitting it to begin charging the rates it asked the commission to sanction on a permanent basis.

The Middle Tennessee Court of Appeals, in upholding the previous decision of a chancellor that Southern Bell should be permitted to put its proposed rate schedule into effect, said it "found the facts in favor of the complainant (Southern Bell), that it was operating at a loss of about $3500 a day, and that the order of the commission complained of did result in the confiscation of the property of complainant and was therefore unlawful."

The Fulton County (Atlanta) Superior Court, in the Georgia case, in a brief order withdrew a previous restriction limiting the amount of increase to that sought by Southern Bell in its first petition. The result was that the company is permitted to begin charging its new rate schedule without commission action.

Previous court history of the Bell System rate cases in the postwar era has been reviewed in this space before. It is a history which is wholly consistent with the laws and philosophy of this nation relating to utility rate regulation. Following World War II, no less than its predecessor, the nation's courts are finding that telephone investors have a right to a reasonable return, and that telephone company managements and directors, in their quest for sufficient capital to finance service expansion and improvement, should be in a position to pay dividends sufficient to attract that capital.

On another subject with a very direct bearing on telephone rates, wage schedules in the industry are continuing to push upward. Two uints of the Bell System have been involved in recent major labor developments.

An agreement reached between the Southwestern Bell Telephone Co., operating in five states, and a division of the Communications Workers of America covers some 50,000 workers in all departments, and calls for an average 10.55-cent hourly boost. The accord, averting a strike threat, calls for raises of from $3 to $6 for all employees, plus some fringe benefits.

Because of the large increase in its payroll expenses, a company spokesman emphasized: "This means Southwestern Bell will have to seek telephone rate increases over and above those it already has applied for or obtained in the various states. We simply have no other place to get the money necessary to show an adequate rate of return." The boost is estimated to cost the company about $11.5 million annually in increased wages.

Meanwhile, hearings were to start in mid-January on the appeal of the Indiana Bell Telephone Co. to an award of a state-appointed arbitration board. Indiana Bell contends the award, calling for boosts, of 10 and 11% , was not in accordance with the states's arbitration law.

The board proposed increases of 11% for employees earning up to $50, and 10% for those making $50 or above. In addition, there was a "breakage" provision under which workers getting boosts of 50 cents or more above the even dollar would be moved up to the next dollar, while those getting 49 cents or less above the nearest dollar would revert to the dollar amount. For example, a worker getting a percentage raise of $5.50 actually would receive $6, while one getting $5.49 would actually have his pay boosted to $5. In practice, it was understood, the provision added more to the company's wage cost than the exact percentage increase would have.

The arbitration award was understood to have averaged out as follows—accounting, $4.365; plant, $5.58; and traffic, $4.20.

The appeal request of Indiana Bell was accepted by the Marion County Circuit Court, which agreed to review the decision. Meanwhile, the effectiveness of the wage in-

creases has been stayed. The company pointed out in the appeal that it bargained with the union with the aim of granting a reasonable wage boost. Cost to Indiana Bell of the arbitration award was estimated at $1,485,900, compared with the company's final offer before arbitration of $1,130,000.

Television Developments

The march of television, perhaps the biggest story of 1948 for the communications industry, is just about certain to top all other events in 1949, if the prognosticators are even 10% correct.

Sooner or later, TV is deemed certain to be an important aspect of the service rendered by Independent telephone companies, as the video networks continue to spread throughout the land and the FCC studies plans to extend local station allocations to the smaller cities and towns of the country.

The New Year, for the industry, was kicked off by an important accomplishment, the opening of the Bell System's east-midwest television relay network. But even before the event, TV's growing pains were causing anguished cries from video broadcasters that the channel space is inadequate for the "infant" industry. Moving ahead as rapidly as possible, and expediting its earlier schedules, the Bell System announced that the two Chicago-Philadelphia channels will be backstopped by two others in June. Two of the links, come June, will be available only after 6 p.m.—when they are most needed—as the coaxial cable channel space will be used during the day for message services like toll telephone and teletypewriter exchange.

For the smaller cities and towns, however, the big news is still in the making, and is closely tied up with some of the most perplexing engineering and scientific problems to face the Commission in its postwar wrestling with new services, frequency allocations and similar matters which sometimes make visitors to FCC hearings feel like men from Mars listening to an entirely unfamiliar language.

A few months ago, the Commission, already hard-pressed for channel allocations to cities, and facing the now familiar problem of trying to pour a gallon of water into a quart bottle, found that it didn't have even as much TV space as it thought it did. Unexpectedly widespread propagation of television signals, via the troposphere, is making a shambles of the earlier channel spacing plan.

The result was a freeze of TV station grants, pending some kind of solution, and a fast look at the "upstairs" ultra high frequency area allocated to television several years ago. Unfortunately for what looked like an easy solution—prompt opening of the upper band for commercial service—the Commission learned that engineers estimate several years will be required for full development of equipment which can work in the UHF range. Furthermore, proponents of color TV in the near future urged that some or all of the UHF area be withheld for color video.

The Radio Manufacturers Association, in a proposal which it said is supported by 95% of the TV industry, has come up with what may be the solution to the problem, and has presented it to the FCC.

The RMA plan calls for the present very high frequency space to continue as the "backbone" of nationwide TV service, particularly in the larger cities. UHF allocations, the RMA committee said, should be made "promptly"—in this case, two or three years—in the smaller cities. Allocations would be made under the RMA proposal to avoid overlapping as much as possible, thus eliminating the necessity for two-band sets except in isolated instances. The committee said the plan would permit at least four TV stations in each city, giving the fullest opportunity for competition and for outlets of several networks.

The Association announcement said "Future color television was discussed briefly but industry opinion was that it is far distant and would require even higher UHF frequencies than the present television or the supplementary UHF frequencies."

A. T. & T. Expansion Continues Pace

The expansion program of the Bell System and the American Telephone and Telegraph Co. since the end of the war, characterized by the Wall Street Journal in an excellent summation in its lead article Dec. 21 as the biggest program ever undertaken by a private corporation, is to be continued on a high level in the months to come to meet the needs of the public for good telephone service. This pronouncement on the continuance of the program came in a statement by President Leroy A. Wilson of the A. T. & T.

"We have spent over $3 billion for new construction since V-J Day and plan to keep right on at a high level in the months ahead," Mr. Wilson stated, "in order to meet the public's need for good telephone service.

"In fact, we have a lot of new ideas for improving methods and equipment and the service should get better all the time," the A. T. & T. President stressed.—THE END.

Coming Conventions

Minnesota Telephone Association, St. Paul Hotel, St. Paul, January 24-26.

Kentucky Independent Telephone Association, Phoenix Hotel, Lexington, March 15.

Texas Telephone Association, Baker Hotel, Dallas, March 21-23.

Ohio Independent Telephone Association, Neil House, Columbus, March 28-30.

Iowa Independent Telephone Association, Fort Des Moines Hotel, Des Moines, April 5-6.

Executives Conference, United States Independent Telephone Association, Edgewater Beach Hotel, Chicago, April 11-12.

Nebraska Telephone Association, Lincoln Hotel, Lincoln, April 19-20.

Illinois Telephone Association, Hotel Pere Marquette, Peoria, April 27-28.

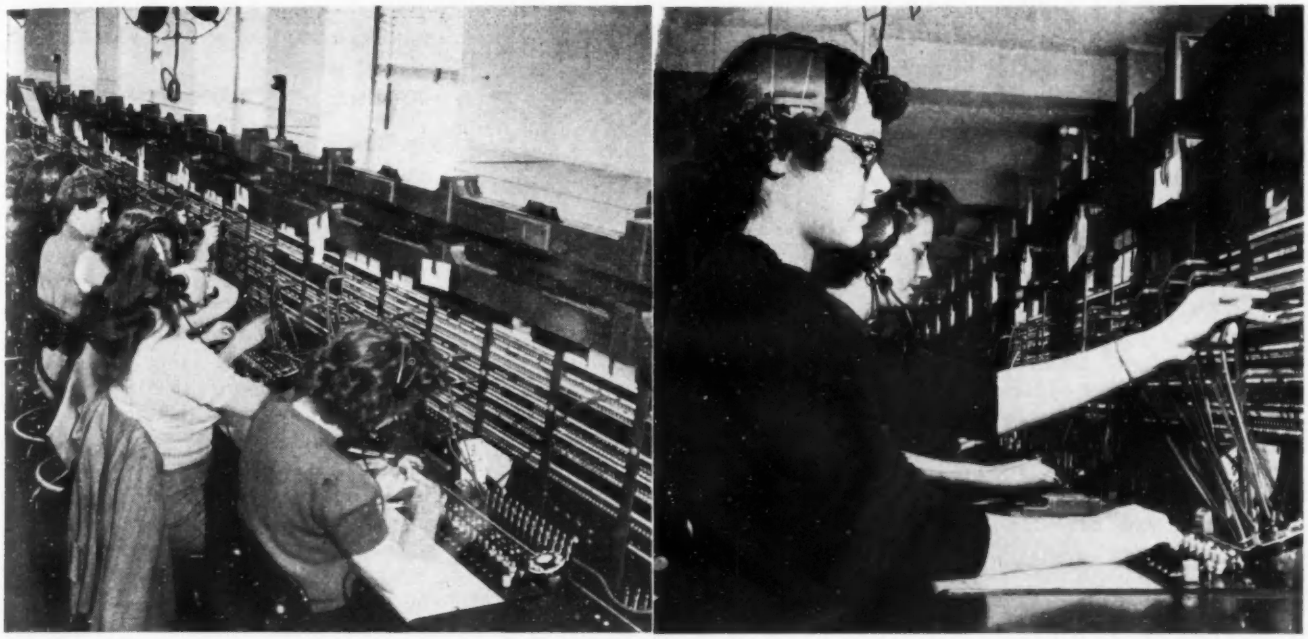
Indiana Telephone Association, Claypool Hotel, Indianapolis, May 4-5.

Pennsylvania Independent Telephone Association, Abraham Lincoln Hotel, Reading, May 9-10.

Kansas Telephone Association, Jayhawk Hotel, Topeka, May 17-18.

New York State Telephone Association, Jamestown Hotel, Jamestown, May 25-26.

California Independent Telephone Association, Biltmore Hotel, Los Angeles, June 23-24.



"Each subscriber using our services—toll and local—has the status of an open charge account. Because of toll calls, the amount of credit involved between bills is practically unlimited and unpredictable."—Photos by Sioux City (Iowa) Journal.

Good Collection Results Depend Upon

Development of Good Paying Habits

By T. R. Harrell

Commercial Supervisor,
C. & P. Telephone Co. of Virginia,
Richmond, Va.

WE IN THE telephone industry have a lot of problems in common—problems which are peculiar to our type of enterprise, and collections is no exception. The nature of our business shapes our collection problem and gives it unique characteristics.

In the first place, we are dealing with a large number of accounts and although the amount of the average bill is small, the total amount involved is important to our operations.

In the second place, each of our accounts has the status of an open charge account and because of toll charges, the amount of credit involved between bills is practically unlimited and unpredictable.

In the third place, as a public utility we are obligated to accept as customers any and all comers, be their credit good, bad or indifferent, with only the right to protect ourselves against losses by advance payments, by deposits and by our skill at collections.

In the fourth place, low cost is of prime importance to use in fulfilling our policy of furnishing service at the lowest cost, with fair pay to employees and a reasonable return to the investor. This applies to the expense of collecting our revenues as well as to the expense of uncollectible losses.

Last, but far from least, the customers with whom we deal are also, in a sense, our bosses, for in a Democracy, the public is King and our public relations must never be forgotten or neglected.

A sound objective under these conditions would be to collect our bills promptly, at reasonable cost, with minimum losses and with the least irritation to our customers, or, in other words, with the best possible public relations.

To achieve this objective, we need to keep a constant watch on two things—new conditions and old fundamentals. The telephone industry cannot help being profoundly affected by the new conditions of today. Virginia's population has grown during the last seven years by 325,000, about equal to the combined population of Richmond and Roanoke. Even more far reaching, Virginia's income per capita has risen from $402 in 1939 to approximately $1100 today and is still climbing. Merchants, Doctors, Farmers, City Dwellers, white collar and no collar workers—all of these have more money than ever before in our history and the telephone industry feels the effects in many ways. We feel it in heavy demand for new service, in mounting requests for better grades of service, in huge construction programs, in high prices for labor and material, and inevitably, in collections.

Lots of money in circulation, customers able to pay bills, shortages of many things, big demand for telephone service, long waiting lists,

fear of losing service, these "Seller's Market" conditions went on for so long that the collection job became abnormally easy, indeed almost automatic. Our denials for non payment got down to less than half the prewar rate and uncollectible losses shrank in the same way.

The danger in this situation is obvious. Unless we are alert and well prepared, a gradual change or a sudden storm would catch us with our defenses down, with our collection policies not adjusted to real conditions, with our practices out of date, and with our employees not trained in handling collections under tough conditions. If that happens, we can look for serious difficulty in collecting active accounts, we can look for increased final bills, for greater costs in collecting our money and for substantial losses in uncollectible accounts.

I said "if that happens," but in fact, that is already happening, at least to some extent. Some signs are already plain. Bankruptcies, which used to run around 12,000 per year in the United States before the war, dropped during the war to less than 1,000 per year. They are now back to a level of around 3,000 per year, not an alarming rate but a definitely rising trend. In our company, denials for non payment are back to the prewar level and are two and one-half times the low level of 1945. Uncollectible losses are 60% higher than they were at the end of the war and show a rising trend. Reports from our business offices all agree that collection conditions have grown more difficult and seem to be getting more so, although conditions are not alarming.

There are times when any change would be an improvement but this does not look like one of them, for all in all, the new conditions of today are changing for the worse and tomorrow may be well worse still.

Credit Policies Need Adjusting

To meet the situation today, and to be prepared tomorrow, certain steps are indicated. First, we should adjust our credit policies realistically, both in accepting new business and dealing with existing customers. In recent studies, we have found that a relatively heavy proportion of our losses come from new customers. Our studies also show that a considerable part of the new business now going on our books might properly be called marginal, consisting of people who have money today but who, in times of economic storms might disconnect their

T. R. HARRELL

telephone with losses to us. In our company we have found it necessary to review and tighten our credit policies. Except where the credit of the applicant is established, we ask for the service connection charge ond one month's rental in advance, and if it appears that risk is involved, we ask for a deposit sufficient to cover an estimated two months' charges. Existing accounts are being given a closer follow-up and the extension of credit is being watched carefully.

As a second step, we should see that our collection practices are up to date and are geared up to actual conditions. The collection job starts when the customer walks in the door. In fact, the preparatory work, the training, etc., starts even before the customer arrives.

In reviewing our practices, we might ask ourselves such questions as these:

Are we getting good credit information? Our experience indicates that the applicant's occupation and length of employment are the most reliable clues to his credit, but some help may also be obtained from the customer's appearance, location, ownership of property or references.

Are we doing a good job of evaluating credit information after we get it? Are we putting the customer in the proper credit classification? Are we collecting the service connection charge and advance payment or deposit where appropriate?

Are we promoting good payment habits by explaining our billing practices to the customer and by educational treatment soon after the first bill is rendered, and again later on if necessary?

Are we alert to catch bills of abnormal amounts so as to take prompt collection action and hold down the size of losses?

Are we systematic in treating accounts, following a regular schedule so that accounts do not build up for lack of attention?

Are we selecting the right accounts for treatment, concentrating our efforts where they are needed and avoiding the waste motion of indiscriminate treatment? Treatment should be based on all the circumstances, including the customer's credit, the amount of the bill, and the length of time the account has been unpaid.

Are our treatment steps effective, and do we try to build up good payment habits rather than merely collect this month's bill and then repeat the process each month?

Are our overtones good, and do we deal with customers in a way which will build satisfactory relations?

Are we watching for changes in the credit of individual customers? The credit of a customer may change substantially from time to time and alertness in noting such changes can often save unnecessary losses.

Credit Classifications

It may be of interest to outline briefly the treament practice followed by our company. We divide our customers into four credit classes as follows:

Class A—Customers of unquestionable credit who are subject to treatment only upon approval of the Manager.

Class B—Customers of known good credit, whose bills usually are permitted to run two months before being subject to treatment and denial.

Class C—Customers whose credit is not known and whose bills are permitted to run only one month unless the account is small.

Class D—Customers whose credit is known to be poor and who are watched very closely, being subject to treatment and denial within 26 days after the date of the bill.

Our treatment steps consist of a reminder notice, either by mail or telephone, a denial notice which follows the reminder notice by five to seven days, and a verification call which is always made before denial to verify that the customer knows the service is about to be denied. These treatment steps often result in pay-

(*Please turn to page* 52)

The one millionth rural telephone to be added by the Bell System since World War II was placed in service December 16 on the farm of MR. and MRS. WILLIAM J. PACE in Alamance County, N. C. Mr. Pace is shown at center receiving the instrument from RAY F. HEWITT, Southern Bell installer, as Mrs. Pace smiles approval.

Millionth Bell Rural Telephone Since War

Installed On North Carolina Farm

THE ONE MILLIONTH rural telephone to be added by the Bell System since the war was placed in service December 16, 1948, by the Southern Bell Telephone & Telegraph Co. in the farm home of W. J. Pace, 13 miles north of Burlington, N. C.

The first call from the telephone was made to President Harry S. Truman in Washington.

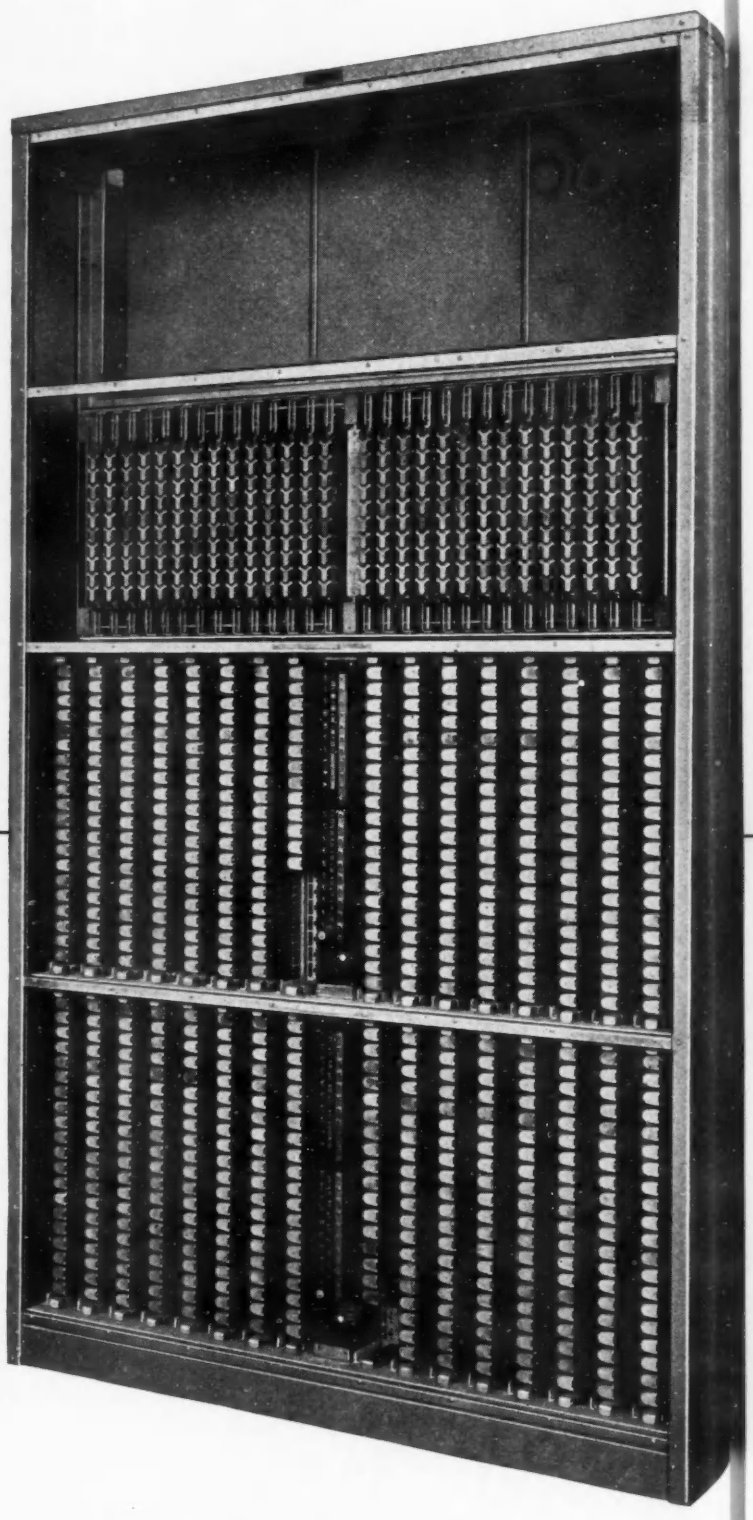
With the addition of these million telephones there are now more than 2,300,000 Bell System telephones serving rural areas—65 per cent more than there were on V-J Day, telephone officials said, adding that about 45 per cent of the farms of the country now have telephone service.

North Carolina's Governor-Elect W. Kerr Scott, himself a farmer and dairyman, was a participant in ceremonies at the Pace farm. He characterized the installation as symbolic of the progress being made in eliminating the isolation of the farmer.

"Good roads, electricity and telephones are not luxuries for the farmer; they are necessities," he said. "The farmer must have good roads to get his produce to market. He must have electricity to do the chores and save labor. He must have a telephone for the orderly marketing of the crops he produces." He pledged that in his four years as governor, he would cooperate in the expansion of these facilities.

Also present were U. S. Senator J. Melville Broughton, of North Carolina, who had placed the call to President Truman; state government officials, agricultural leaders and representatives of the telephone industry, including Hal S. Dumas, of Atlanta, president of Southern Bell Telephone & Telegraph Co., and Frank S. Barnes, of Rock Hill, South

how you can add 10 lines in 10 minutes . . . with the new Leich Dial System



You've no problems or worries about future growth when you have a Leich Dial Switchboard.

The opposite page shows how you can add 10 lines in 10 minutes or less. There's no soldering, no wiring, no installation expense other than the price of the 10 line relay bar which is necessary to add 10 lines.

Even links can be added to your Leich Dial Switchboard in a matter of an hour or two — by your own switchboard man — with no soldering, wiring or possibility of error.

Combine this flexibility with the dependable operation made possible by this simplified type of relay operation, and you have every reason to want to investigate the Leich Dial System very carefully before deciding which dial switchboard is best for your exchange.

If you would like to receive the 20 page catalog which completely describes the Leich Dial Switchboard, just write Leich Sales Corporation, 427 W. Randolph St., Chicago 6, Illinois.

Total Time **10 MINUTES**

You can't do this wrong if you try. It's almost as simple as turning on the electric light. And, with this economical, sensible preparedness for future developments, the Leich Dial System gives you the reliable, trouble-free service for which relay switching is so well known. Why not write for catalog which gives complete details. Address Leich Sales Corporation, 427 W. Randolph St., Chicago 6, Illinois.

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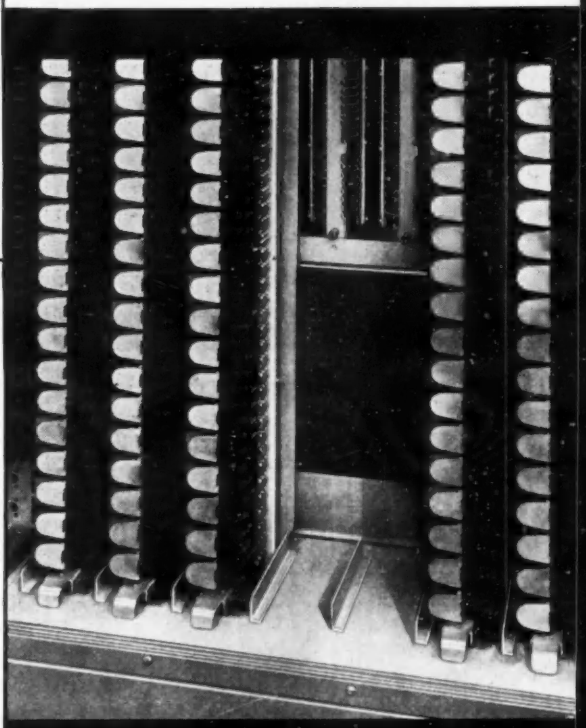
1

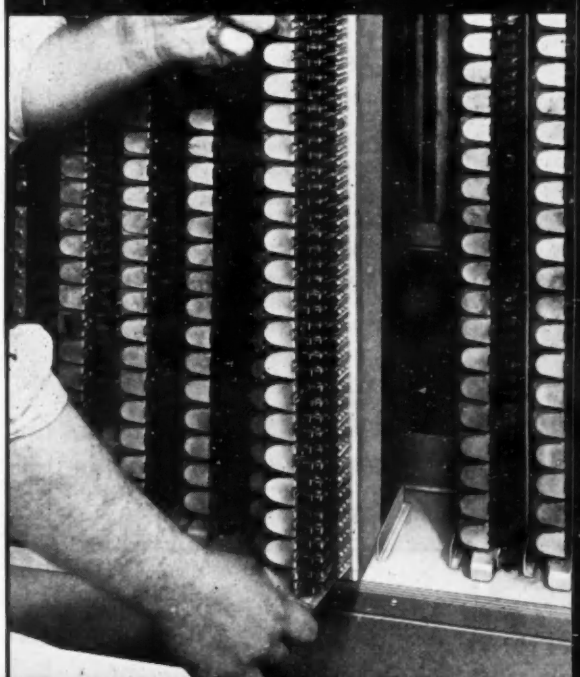
Single, jack-in relay bars contain the line and cut-off relays for each group of 10 lines. These come from the factory in a single carton — wired, tested, ready to be installed. They are carried in stock for immediate shipment.

2



This shows the section of the Leich Dial System where the line relay bars are jacked-in. Every switchboard is fully wired and contains the jacks for plugging-in these 10-line relay bars up to the full capacity of the board.

3



All that's necessary is to jack-in the relay bar units as shown here. Each relay bar jacked-in adds 10 lines to the switchboard.

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The proved and standard Protection for Underground Telephone Cables.
Cheapest in the long run. Highest quality and a full line of shapes.
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PREMAX

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Premax Products

Division Chisholm-Ryder Co., Inc.

4945 Highland Ave., Niagara Falls, N. Y.

Telephone linemen are shown building the line leading into the farm of William J. Pace in Alamance County, N. C., where the one millionth Bell System telephone added since World War II was placed in service on December 16 by Southern Bell Telephone & Telegraph Co.

Carolina, president of the United States Independent Telephone Association.

Other calls from the Pace telephone were made to Governor Gregg Cherry of North Carolina in Raleigh and to Leroy A. Wilson, president of the American Telephone & Telegraph Company, in New York.

Rural Expansion Program To Continue at Fast Pace

More than 175,000 of the 1,000,000 rural telephones added were placed in service by Southern Bell, Mr. Dumas pointed out. He stated that the Bell companies would continue to push their rural expansion and improvement program but emphasized that large amounts of money would be needed to do the job.

"The rural telephone expansion program, undertaken by the Bell System in 1945, called for the addition of a million telephones in rural areas within five years," he said.

"The job has been done in a little over three years. This meant adding rural telephones at the average rate of more than 1,000 every working day—over three times the rate of any previous period in Bell System history—despite serious shortages of supplies of all kinds."

Another phase of the Bell Companies' rural program has been the improvement of service. Good progress has been made in reducing the number of parties on a line, it was said, as well as replacing the earlier-type telephones with the more up-to-date type of instruments and in other ways modernizing the service.

An important feature of the system's program also has been a substantial increase in the amount of new pole line which the companies will build for each new customer without charge. This construction allowance generally amounts to a half mile of new pole line for each rural customer.

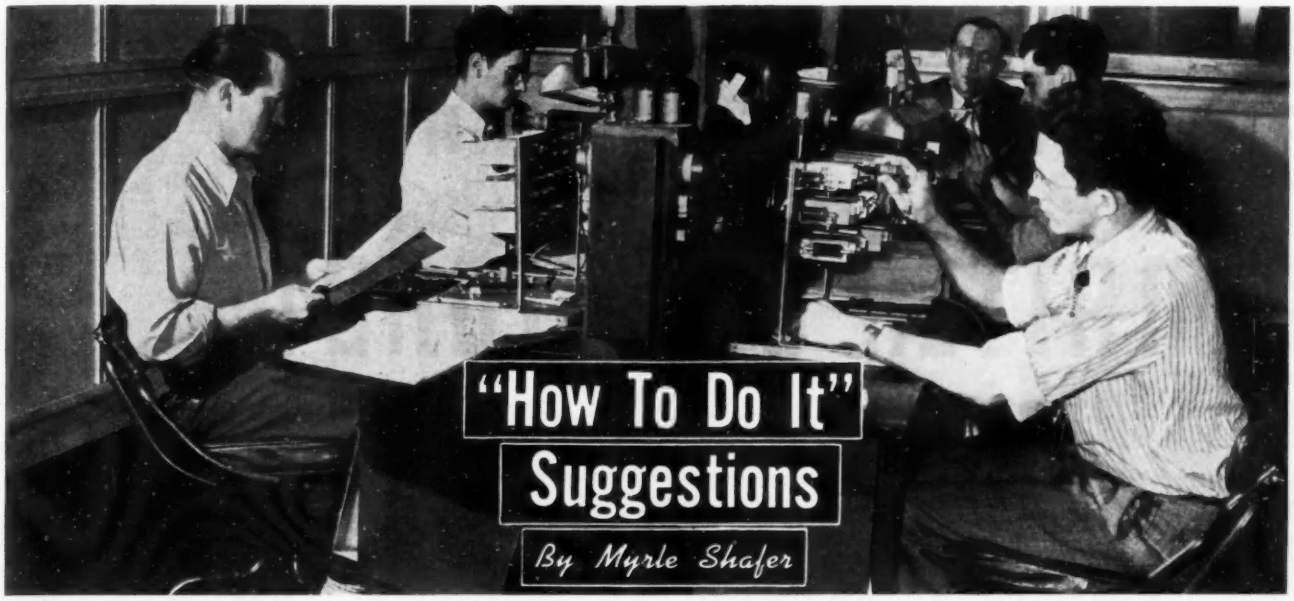
Fast, economical construction methods developed and perfected by telephone engineers in recent years have helped speed the work of extending and improving telephone service in rural areas. Poles are now set farther apart, thanks to a new stronger wire. Better tools such as portable power-driven augers to dig pole holes have helped speed the lineman's job.

The rural telephone program, undertaken by the Bell System in 1945, when men and materials again became available following the war, called for the addition of a million telephones in rural areas within five years. This was the first postwar step in resuming the active extension and improvement of service in rural areas. The job has been done in a little over three years despite serious shortages of supplies of all kinds.

Fulfillment of the program has required the efforts of an army of engineers and rural telephone specialists, and vast amounts of materials and equipment. It required about one and a quarter million telephone poles and the stringing of about half a million miles of telephone wire—enough to stretch around the world twenty times.

Today, as a result of the record performance of the Bell System companies and the active rural building programs of Independent telephone companies, it is estimated that about 45 per cent of the farms of the country have telephone service—more than at any time in history. This compares with 32 per cent at the beginning of 1945, and 25 per cent at the beginning of 1940.

The attainment by the Bell System of its initial objective of adding a million rural telephones does not mean that the task of bringing telephone service to rural America is finished. The work goes right on, as the telephone companies continue to go forward with the job of providing still more and better telephone service in farm territory just as fast as they can. To carry out this program large sums of money must be raised by the Bell companies to finance the heavy cost of rural construction.—THE END.



"How To Do It" Suggestions

By Myrle Shafer

Methods of Determining Toll Rates

SMALL INDEPENDENT telephone companies use the following methods to determine toll rates between two specific points within their operating areas:

(1) For distance of 40 miles or less, the rate is determined by measuring the airline distance between the desired points. To insure accuracy, post road maps used by the United States Post Office Department are employed, rather than road maps.

(2) For distances greater than 40 miles, use is made of block rate mileages provided at toll centers. This arrangement enables a rapid determination of the distance between any two given points. Independent tributary exchanges utilizing toll-center facilities of another company can obtain the desired block rates and mileages from the toll centers.

Procedures for Eliminating Power Noise Induction

MANY REQUESTS have been received by our readers for methods that will overcome noise induction in their open-wire telephone circuits resulting from power lines paralleling the telephone circuits. In such cases, the circuits were comparatively quiet until the power lines were extended into their areas.

The following steps are required to eliminate the noise induction:

(1) Metallacizing all telephone circuits involved in the parallel. (Note: It is possible to metallicize that portion of the circuits involved in the parallel and isolate the metallicized portion from the grounded portion by means of repeating coils. This procedure is not recommended if there is a possibility that the power lines may be extended still further later on.)

(2) Trim all trees and shrubs in contact with the line wires.

(3) Replace broken and "floating" insulators, using standard glass insulators in all cases. Make sure that no wires are in contact with the crossarms or pole.

(4) Remake all hand-made splices, using compression or rolled sleeves for long lasting noise-free connections. Replace loose or corroded test connectors with new connectors or use tap compression sleeves.

(5) Use high impedance ringers in ground ringing systems or bridge the ringers across the line.

(6) Transpose all lines in accordance with a standard transposition scheme that eliminates both crosstalk and noise pickup. Check all transpositions to make sure that each has been properly made in accordance with the scheme and that none have been omitted or misplaced.

Metallicizing ground return circuits is the most important step of all. Without this, no other remedy is possible. The other steps can be tried one at a time in the indicated order until the noise trouble is cleared up.

If all the foregoing methods are not successful in effecting the desired amount of noise reduction, the next step is to consult the power company and have it locate the unbalance in the power lines that is making the telephone circuits noisy. If the power line is of the isolated 3-phase type, bad transformer bushings or leaking power insulators can cause the noise trouble. Large motors with poor wave-form create harmonics of the 60-cycle fundamental that appear as noise in the telephone circuits. In the latter case, the power company will install filters to absorb the harmonics and eliminate the noise from this source.

Sometimes an unbalanced cord circuit in a manual switchboard or unbalanced line relays in connector switches of a dial switchboard will result in noise currents flowing in the circuits.

Regardless of how difficult a noise induction problem is, patience in following through all necessary steps will accomplish the desired results. Help can always be obtained from the larger connecting companies. Close cooperation between the telephone company and the power company is desirable in cases where the trouble appears to be in the power lines.

Losses in Open-Wire Carrier Circuits

CERTAIN LINE conditions that have no effect on voice-frequency circuits will cause serious losses in carrier circuits. For example, toll testboard men know that whenever a dense fog materializes along an extended stretch of toll lines operating on carrier frequencies (6000 to 30,000 cycles), a transmission loss of as much as 40 decibels will result. Wet snow or hoar frost has a similar effect.

This loss is not due to any supposed conducting property of the moisture droplets in the liquid or frozen state since pure water is an extremely poor conductor. Rather, it is a dielectric loss due to the presence of moisture droplets in the electric field surrounding the wires. This dielectric loss is a hysteresis effect similar to the magnetichysteresis occurring in the iron cores of transformers and a-c relays and is proportional to the frequency of the a-c voltage impressed on the circuit. The higher the frequency, the greater is the loss. At voice frequencies, the

STROWGER
AUTOMATIC PERFORMANCE
IS
A MATTER OF RECORD!

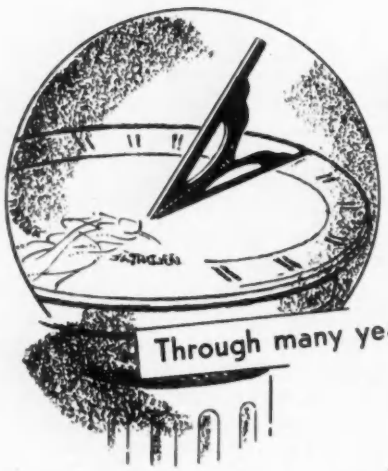
Strowger Automatic equipment is time-tried and tested. Its performance is shown in the operating records of hundreds of telephone companies and administrations throughout the world.

In all climates, under all operating conditions, these companies are enjoying the benefits of the unequalled range of features which Strowger Automatic provides. They have found Strowger equipment economical to install, requiring minimum space. Flexible to the maximum degree, its component parts can be "tailored" to fit any conditions, and it is readiy adaptable to growth and changes in traffic. And through its long life, it assures the lowest maintenance cost of any automatic switching mechanism.

The unequalled variety of services which make Strowger Automatic so valuable can be applied one by one to meet the needs of any installation. Strowger equipment, with the "Director," is serving the giant metropolitan area of London, England. It can be supplied to fit any system of toll dialing, and, with Strowger Automatic Toll Ticketing equipment, to handle metropolitan area toll calls, on a subscriber dialing basis. At the other extreme, Strowger Automatic is economically serving the smallest exchanges, in small towns and rural areas. No exchange is too small and none too big.

No matter what kind of service is desired, Strowger Automatic can provide it—including service to automatic or manual private exchanges, to city party lines, to multi-station rural lines, to Autelco-Gray paystations —every variety of service, in fact, that is encountered in actual service anywhere.

But the best proof of Strowger excellence is the financial reward it brings to operating telephone companies. That, too, is a matter of record! Look at the balance sheets of the various operating administrations. Ask any user of Strowger equipment, anywhere in the world. Your choice, then, will be Strowger Automatic.



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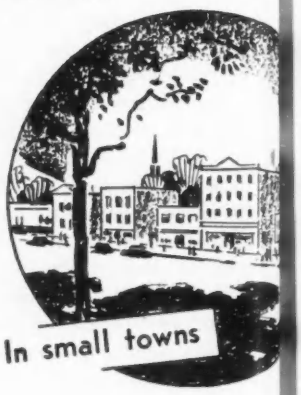
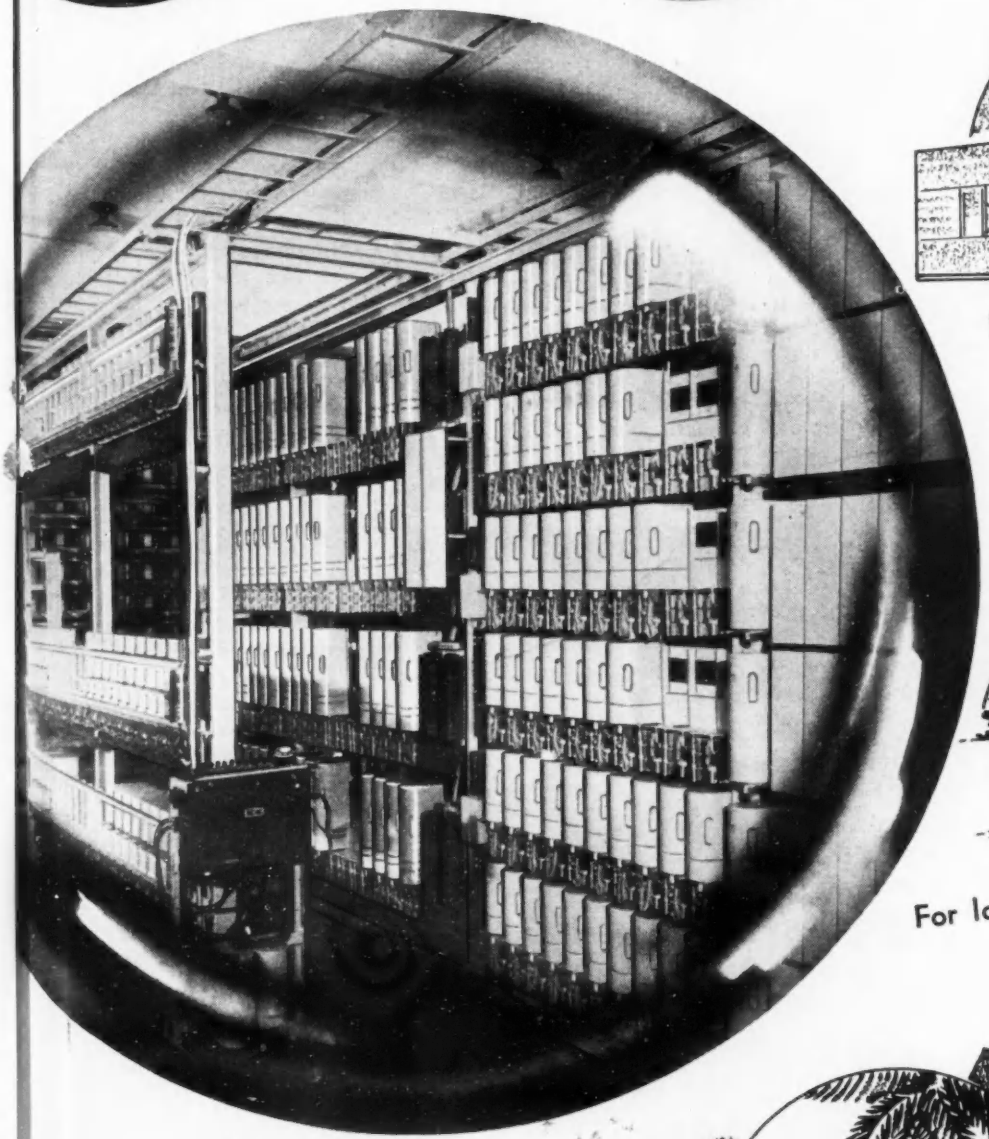
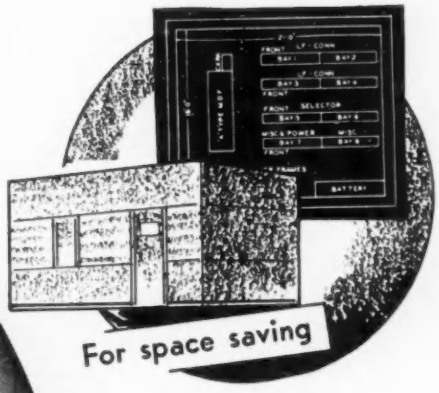


nancial results

For variety of services





For space saving

For lowest maintenance cost

In the Tropics

In the frigid North

dielectric loss is negligible, but at carrier frequencies, it becomes significant, being manifested as a shunt loss.

A special type of glass insulator, known as the CS type was developed to reduce the high frequency loss in water film due to rain falling on the surface of line insulators, but it does not entirely overcome the fog or hoar frost difficulty.

Carrier circuits will operate with little more than the usual line losses when the physical circuit is open and the wires are lying on the ground. In this case, the associated voice-frequency circuits will be completely inoperative.

Replaceable Bit Rooter Requires No Special Tools

DITCHERS can operate more efficiently if the rooters, or teeth as they are sometimes called, on the digging buckets, are kept sharp. Since they receive the brunt of the wear, they eventually become dull. Replacing the entire rooter was a time consuming operation and often required an acetylene torch to remove the old teeth.

To meet this problem the Quick-Change Rooter Bit has been developed. This bit consists of two members, a holder which is bolted to the bucket and a removable bit or cutting edge which can be readily replaced when worn.

It is only necessary to hammer new bits into the holder. A wedge-shaped socket or cavity in the holder receives a corresponding shaft in the bit. This shank has a V-spline which holds once it is driven into the socket and "stays put". No bolts, keys or special tools are required. (See Fig. 1.)

To remove the worn bit a drift pin is placed in a slot in the bit holder and a sharp blow on the pin is applied with a hammer. The bit pops out. In field tests under various conditions no bit has given any indication of coming loose from the holder or loosening up in the holder.

New Rotary Concrete Drill Offers Time Saving Features

WE RECENTLY watched a new and improved rotary concrete drill turn in a performance that made possible a substantial cost-per-hole saving.

Because of a unique core drill design and a side exhaust slot which permits core particles to escape, the new drill penetrates concrete at the rate of two inches or more per minute in diameters of from ¼" to 2". Specially-treated sintered carbide cutters, located around the perimeter of the core where they operate at the most efficient speed,

Fig. 4—Top photo: Driving new quick change bit into holder. Bottom photo: Driving bit out of holder, using drift pin.

exert a quiet, pulverizing action which drills holes faster and leaves them straighter and cleaner. (See Fig. 2.)

By reducing labor time per hole to a fraction of that consumed by other methods, the drill effects an important saving in many kinds of maintenance and installation work.

The drill bit is designed for use with ordinary electric drill motors and we can report that glass, steel and rock, when imbedded in concrete, are easily drilled with the tool.

How Is a Good Telephone Installer Rated?

THE TELEPHONE installer, like the commercial department employee, comes in direct, personal contact with subscribers daily. He works on the subscriber's premises and often has to discuss the proposed installation with the subscriber. He thus represents his company in its relations with the public. While a good personality and a genuine liking for people are helpful in these personal contacts, subscribers prefer to deal with workers who are efficient, unobtrusive, neat, and courteous. From this veiwpoint, a first class installer is one who:

(1) Plans his job and brings a completely stocked working kit so he won't have to run back and forth to his car for forgotten items. He sees that his car is supplied with sufficient materials and tools for his assignments.

(2) Carefully surveys the subscriber's premises to determine the best route for the drop so that a short vertical run on the building, rather than a long horizontal run, can be placed and the station protector is not located too far away from the wire entrance or the ground connection to a water pipe.

(3) Uses an outside protector whenever required to avoid an unsuitable inside protector installation and places the protector in an accessible location but out of reach of small children.

(4) Puts up his drop wire where it will not go over or through trees and shrubs and where it will not pass close by windows to obstruct the owner's view.

(5) Asks for a cable reassignment to avoid runs past cable terminals.

(6) Takes note of bad drop wire situations and reports them to his supervisor so cable or open wire extensions may be considered to relieve the congestion.

(7) Complies with the subscriber's wishes as to the location of the telephone or tactfully suggests a more suitable place to avoid having the in-

Fig. 2—New rotary concrete drill reduces labor time per hole to fraction of that consumed by other methods.

Fig. 3—Steel raceway provided completely clear channel for conduit.

strument on a flimsy table, in a narrow passageway, or within reach of small children.

(8) Is careful not to track dirt into the house and avoids wearing hob-nailed boots that would mar the floor.

(9) Arranges his tools and materials in an orderly manner, protects finished surfaces from contact with sharp-edged tools, and takes care not to leave wires in doorways and near stairs for someone to trip over.

(10) Conceals inside wire in partitions or walls whenever practicable, and routes exposed runs neatly, using the type of fasteners suitable for the location of the run.

(11) Mounts wall sets and bell boxes neatly and securely with the right number and proper kind of fasteners for the type of mounting surface.

(12) Cleans up and properly disposes of all debris resulting from work operations before leaving the subscriber's premises on completion of the job.

Steel Raceway Simplifies Installation Problem

WHEN "The Oregonian," newspaper published in Portland, Ore., decided to lease to the U. S. Army Engineers for office use the space in its new building that had been reserved for a cafeteria, no one wanted to break into the new walls for supplemental telephone wiring installation.

An electrical contractor came up with the solution, using a surfaceduct steel raceway installation of 75 feet from the main panel, in the right of the picture, (See Figure 3) to branch panels out at left and right on the wall. The main telephone conduit carried 100 pair of telephone wires, with 50 pairs feeding out in each run of the Surfaceduct.

The steel raceway was quickly installed. It provided a completely clear channel for the conduit which was laid in before the capping was snapped in place. After installation, the Surfaceduct was painted to match the wall. The Pacific Telephone & Telegraph Co. endorsed this method of securing supplemental telephone wiring in this new building as it considerably simplified their work.

Help The Other Fellow

MAYBE you've just licked a tough problem. Or perhaps you're still sweating it out, but have at least explored and eliminated some of the blind alleys. Why not outline your problem with its solution, in a letter to the "How To Do It" department?

SPLICER'S TOOLS
Of Top Quality by

- FURNACES
- SOLDER POTS
- BLOW TORCHES
- WIPING CLOTHS
- BALANCED LADLES
- SOLDERING IRON HANDLES
- THAWING TORCHES
- FOLDING SAFETY SHIELDS

Protect Public, Splicer, and Furnace. No. 50 C Shield shown here. of 20 Ga. galvanized steel. Reinforced edges. 23"x17" x17". No. 50 — four-sided with grate. No. 50 A — same without grate.

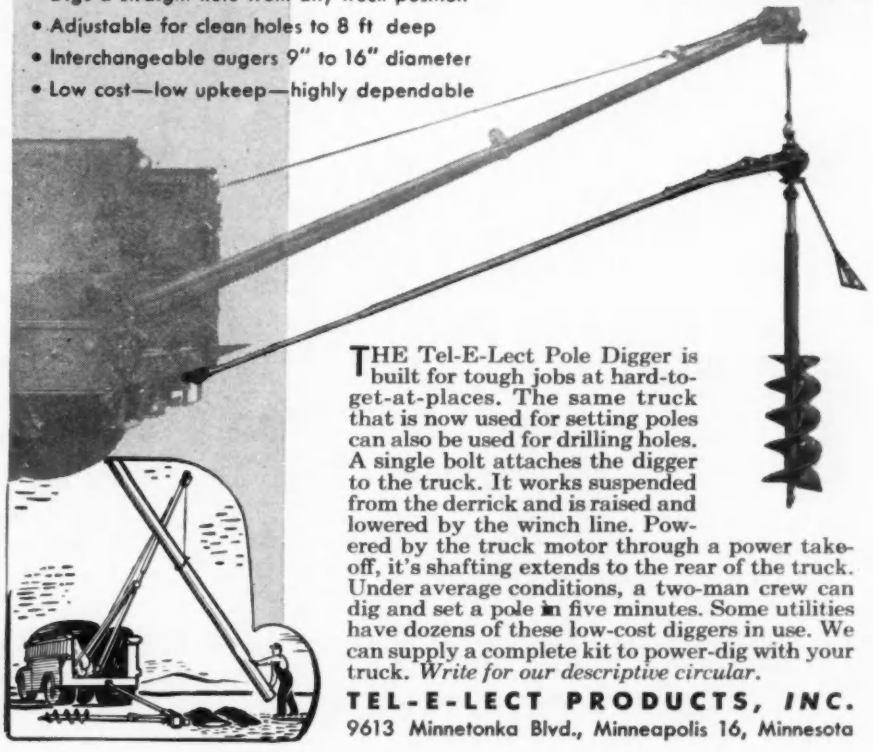
Your Jobber Has These Tools

UNIQUE MANUFACTURING CO., INC.
221 W. Walton St., Chicago 10, Ill.

DIG HOLES WITH YOUR LINE TRUCK AND CREW

TEL-E-LECT POLE HOLE DIGGER

- Digs a straight hole from any truck position
- Adjustable for clean holes to 8 ft deep
- Interchangeable augers 9" to 16" diameter
- Low cost—low upkeep—highly dependable

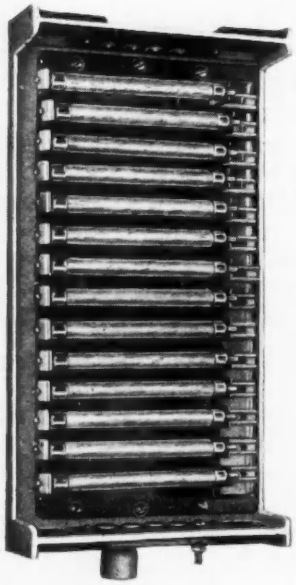


THE Tel-E-Lect Pole Digger is built for tough jobs at hard-to-get-at-places. The same truck that is now used for setting poles can also be used for drilling holes. A single bolt attaches the digger to the truck. It works suspended from the derrick and is raised and lowered by the winch line. Powered by the truck motor through a power take-off, it's shafting extends to the rear of the truck. Under average conditions, a two-man crew can dig and set a pole in five minutes. Some utilities have dozens of these low-cost diggers in use. We can supply a complete kit to power-dig with your truck. *Write for our descriptive circular.*

TEL-E-LECT PRODUCTS, INC.
9613 Minnetonka Blvd., Minneapolis 16, Minnesota

VERSATILE--DEPENDABLE

Automatic Electric's
TYPE 40 - 7 PAIR
PROTECTED CABLE TERMINAL



Type 40 Terminal 7 pair, less stub, with cover (not shown). Cat. No. SA-34

This compact 7-pair-capacity terminal offers complete versatility and protection. It is equipped with detachable mounting bracket (may be bolted to pole before terminal is placed) and the cover is reversible so that cable may be led in from top or bottom. Complete terminal with cover is 7¼" wide, 4¾" deep and 14" long. Has accurately gauged discharge blocks, and 3-ampere wood fuses.

PRODUCT OF SPECIALTY DEPARTMENT OF

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INVEST YOUR "PIN MONEY" IN THE BEST

LOCUST PINS

Locust wood is practically impervious to decay and is impenetrable to moisture. Because of its close-grained hardness locust can be machined into strong, long lasting pins of standard specifications that can be counted on to retain their size and shape.

OAK BRACKETS

Oak pole brackets of unquestioned quality are in demand now as never before in the face of the qualifications necessary in the equipment and materials needed today to "keep 'em talking." Present day maintenance and repair have every reason to demand and get only the best.

GLASS INSULATORS

Research and experiment have produced in Hemingray insulators a glass insulator that is better than any ever before offered.

Non-porous, non-deteriorating, uniform coefficient of expansion and high mechanical as well as high dielectric strength are some of the many qualities that rank Hemingray the "best on the line."

BUCKEYE TELEPHONE and SUPPLY CO.
COLUMBUS 6, OHIO

"Mechanic's Favorite"
TORCH

●Its mechanical and combustion superiority for so many purposes have so firmly established the preference of this torch with professional mechanics of all trades, that it is known wherever blow torches are used as the one-and-only "Mechanic's Favorite!"

Sold through leading Jobbers everywhere

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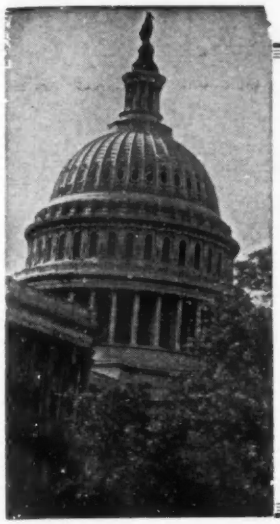

Current COURT and COMMISSION Activities

New Mexico Supreme Court Rules Franchise Is Valid

The New Mexico Supreme Court, in a recent decision held that the Ruidoso Telephone Co. does not need a franchise from the incorporated village of Ruidoso, N. M., in order to operate.

In an opinion by Justice James B. McGee the court ruled that a franchise granted the firm by the board of county commissioners of Lincoln county before Ruidoso was incorporated as a village is still valid, since it did not specify the period of time it would be in effect.

The ruling upheld a county district court judgment dismissing the village's application for an injunction barring the telephone company from use of village streets for its lines.

Bellingham (Minn.) Tel. Co. Granted Rate Increase

Application of the Bellingham Telephone Co. for authority to change its schedule of rates and charges at Bellingham has been approved by the Minnesota Commission.

The class of service for which the company proposed rate revisions, together with present and proposed rates, appears below:

Class of Service	Present Gross Rates	Proposed Gross Rates
Individual Line Business	$2.75(a)	$4.00(b)
Two-party Line Business	2.25(a)	3.50(b)
Individual Line Residence	1.75(a)	2.75(b)
Two-party Line Residence	1.50(a)	—
Four-party Line Residence	1.25(a)	2.25(b)
Rural Multi-party Residence	1.75(a)	2.75(b)
Rural Multi-party Business	2.50(a)	3.25(b)
Extension Bells	—	.25 Net
Service connection charge (instrument in place)— Extension Stations	—	.50 Net

(a) Rates billed quarterly. A discount of 75 cents to be allowed on all gross rates if bill is paid on or before the 15th of the first month; 50 cents if paid on or before the 15th of the second month of the quarter; and 25 cents if paid on or before the 15th of the third month of the quarter in which service is rendered.

When telephone rentals are fixed at more than $2 per month gross, an additional discount of $2 is allowed if paid one year in advance, $1 if paid 6 months in advance.

(b) Local rates billed monthly, and a discount of 25 cents to be allowed if paid by the 15th of the month for which service is rendered. Rural rates to be billed quarterly, and a discount of 75 cents to be allowed if paid by the 15th of the first month of the quarter for which service is rendered.

Central Telephone Co. Granted Rate Increase

The North Dakota Public Service Commission in a recent order authorized the Central Telephone Co. to increase its telephone rates at Cando and Webster, N. D. The new rates will become effective upon the conversion to dial operation which the company expects to have completed within the next two or three months.

In the application it was stated that Central Telephone would invest an additional $47,700 in a new telephone plant and equipment to convert the Cando exchange to dial operation.

Eagle (Neb.) Telephone Co. Rate Increase Extended

The Nebraska State Railway Commission has granted an extension of its order approving an increase in rates for the Eagle, (Neb.) Independent Telephone Co. Increase granted was $1.50 per month net on business telephones and 50 cents on residence telephones.

Nebraska Commission Withdraws Progress Report Order

The Nebraska Railway Commission has rescinded an order it entered last June requiring the Platte Valley Telephone Corp., which serves a number of exchanges from its Scottsbluff headquarters, to make special reports showing what it is doing to meet subscriber complaints. The commission stated that the beneficial effect of the order has largely completed its cause and there is no point in requiring repetitious reports that call for greatly detailed information.

The commission found that because of the phenomenal prosperity and expansion in the North Platte valley the company has been called upon to supply telephone circuits and outside plant beyond its ability to secure. Part of this is traced back to the restrictive measures during war time, a condition faced by many other telephone companies.

Three Nebraska Companies Granted Rate Adjustments

The Nebraska Railway Commission recently authorized rate adjustments for three telephone companies, and took under consideration a similar request from a fourth.

The DuBois Telephone Co. was authorized to increase its charges 25 cents a month; the Lodge Pole Telephone Exchange, $2.50, and the Bassett-Springview Telephone Co. was granted rate increases ranging from 10 to 50 cents. All became effective January 1.

The Chase County Telephone Co., Champion, asked authority to boost all rates $1.75 per month.

Foreston (Minn.) Tel. Co. Granted Rate Adjustment

Application of the Foreston (Minn.) Rural Telephone Company for authority to change its schedule of rates has been approved by the Minnesota commission.

The class of service for which the company proposed rate revisions, with present and approved rates, are as shown below:

Class of Service	Present Gross Rates	Approven Gross Rates
Individual Line Business	$2.50(a)	$4.25(b)
Two-party Line Business	——	3.72(b)

Individual Line Residence..	1.67(a)	2.50(b)
Four-party Line Residence	——	2.25(b)
Rural Residence	1.50(a)	2.50(b)
Rural Business	——	3.00(b)
Business Extensions	——	1.00 Net
Residence Extensions	——	.75 Net

(a) A discount of ten per cent is allowed where payment is made on or before the last day of the month in which service is rendered.

(b) A discount of twenty-five cents per month is allowed where payment is made on or before the 20th day of the month in which service is rendered.

Alexandria Telephone Co. Granted Rate Increase

The Alexandria (Minn.) Telephone Co.'s application with the Minnesota Railroad & Warehouse Commission for authority to change its schedule of telephone rates and charges at Alexandria has been approved. The present and approved monthly rates are shown below:

	Present	Approved
Local Base Area		
Business		
One Party	$ 3.25(a)	$ 5.25(a)
Two Party	2.75(a)	4.50(a)
PBX Trunk, Two Way	3.00(b)	7.75(b)
PBX Trunk, One Way	2.50(b)	5.00(b)
Residence		
One Party	2.25(a)	3.00(a)
Two Party	1.75(a)	2.50(a)
Four Party	—	2.25(a)
Four Party, Wall	—	2.00(a)
Secondary Base Area		
Business		
One Party	—	5.25(a)
Four Party	2.75(a)	4.50(a)
PBX, Two Way	—	7.75(b)
PBX, One Way	—	5.00(b)
Residence		
One Party	—	3.25(a)
Four Party	1.75(a)	2.50(a)
Four Party, Wall	—	2.25(a)
Lake Area		
Business		
One Party	—	5.25(a)
Two Party	—	4.75(a)
Four Party	—	4.50(a)
Residence		
One Party	3.25(a)	3.75(a)
Two Party	2.75(a)	3.25(a)
Four Party	2.50(a)	3.00(a)
Four Party, Wall	—	2.75(a)
Rural and Lake Area		
Multi-party Metallic, Business	—	3.25(a)
Multi-party Metallic, Residence	1.75(a)	2.50(a)
Multi-party Metallic, Wall Residence	—	2.25(a)
Secondary Base Area—Season Rate		
Business		
One Party	—	48.00(b)
Four Party	—	33.00(b)
Residence		
One Party	—	30.00(b)
Four Party	15.00(b)	22.50(b)
Four Party, Wall	—	20.00(b)
Lake Area—Season Rate		
Business		
One Party	—	48.00(b)
Four Party	—	33.00(b)
Residence		
One Party	30.00(b)	36.00(b)
Two Party	24.00(b)	30.00(b)
Four Party	21.00(b)	27.50(b)
Four Party, Wall	—	25.00(b)
Rural and Lake Area—Season Rate		
Multi-party Metallic Business	—	27.00(b)
Multi-party Metallic Residence	15.00(b)	22.50(b)
Multi-party Metallic Residence, Wall	—	20.00(b)
Miscellaneous Charges All Monthly Billing Areas		
Extension Station Business	.75(b)	1.00(b)
Extension Business, Wall	—	.75(b)
Extension Station Residence	.50(b)	.75(b)
Extension Station Residence, Wall	—	.50(b)
PBX Station Commercial	1.00(b)	1.25(b)
PBX Station Commercial, Wall	—	1.00(b)
PBX Station Hotel	.50(b)	1.00(b)
PBX Station Hotel, Wall	—	.75(b)
PBX Station Dial	1.25(b)	1.50(b)
Miscellaneous Charges All Seasonal Billing Areas		
Extension Station Business	—	10.00(b)
Extension Station Business, Wall	—	7.50(b)
Extension Station Residence	5.00(b)	7.50(b)
Extension Station Residence, Wall	—	5.00(b)
PBX Station Commercial	—	12.50(b)
PBX Station Commercial, Wall	—	10.00(b)
PBX Station Hotel	—	10.00(b)
PBX Station Hotel, Wall	—	7.50(b)
PBX Station Dial	—	15.00(b)
Service Switching Station	.35(b)	.75(b)
Private Branch Exchange Boards		
Cord:		
0 to 10 Stations	5.00(b)	
11 to 30 Stations	6.00(b)	
31 to 60 Stations	7.00(b)	
61 to 100 Stations	8.00(b)	
101 to 150 Stations	9.00(b)	
0 to 50 Stations		9.00(b)
51 to 100 Stations		11.00(b)
101 to 200 Stations		15.00(b)
Cordless:		
0 to 10 Stations	3.00(b)	
11 to 17 Stations	4.00(b)	
0 to 12 Stations		5.00(b)
13 to 20 Stations		6.00(b)
Dial:		
0 to 10 Stations	5.00(b)	5.00(b)

Joint User Service $1.00 (b) Present. Under the proposed rates requested, Joint User Service shall be one and one-half times the regular rate for that particular type of service rendered the subscriber.

(*Please turn to page 44*)

BOOKS RELATED TO COMMUNICATIONS

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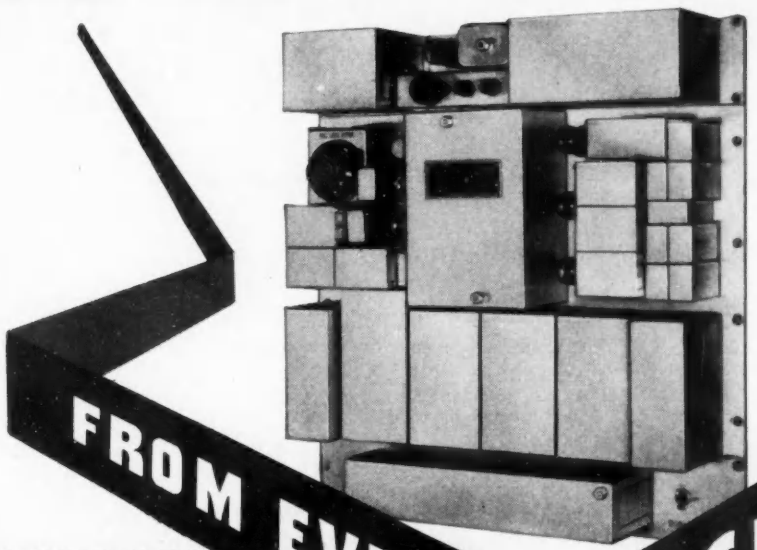

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An excess mileage charge of forty cents per month per one-quarter mile or fraction thereof for Individual Line Service beyond the local base rate area is now on file. It is proposed that this charge be as follows: An excess mileage charge of 30 cents per month per one-eighth mile or fraction thereof for Individual Line Service beyond the local base rate area.

A discount of 25 cents per month to be allowed on all gross rates if paid on or before the 15th of the month in which service is rendered.

Rate Adjustment Approved For Ludowici, Georgia

The Georgia Public Service Commission has approved application of the Ludowici (Ga.) Telephone Co. for authority to increase rates for exchange telephone service at Ludowici.

Rates for classes of service to be charged by the Ludowici Telephone Company for exchange telephone service are: Business, 1-party, $3.50 per month; business, 2-party, $3.00; business, extension, $1.25; residence 1-party, $2.50; residence, 2 party, 2.00; residence extension, 1.00; business rural, multi-party, $2.50, and residence rural, multi-party, 2.00.

The rates for rural service shall apply to all such service provided within two miles of exchange limits of Ludowici. For distances beyond two miles, the following added charges shall apply: two to ten miles from city limits, 25 cents additional per month; four to seven miles, 50 cents; seven to 10 miles, $1.00, and each additional five miles, 25 cents.

The commission also ordered that private rural, business or residence be subject to 40c per ¼ mile beyond base rate area.

Famed Chinatown Exchange Gets Automatic Telephones

There was sighing recently among the Old Ones in San Francisco's Chinatown, as there always has been over the disruption of the established order of things, for the world renowned Chinatown telephone exchange became an item in history.

Already the instruments of 700 of its 2,100 subscribers have been converted from manual to dial operation. And soon after the New Year (according to the Occidental calendar), he remaining 1,400 will meet a kindred fate. Thereafter, the spoken words, "Dey huey bin she ah?" ("Number please?") no longer will greet him who lifts the receiver.

There has been a telephone exchange in Chinatown since 1894, when the first one was situated in the newspaper and insurance office of Loo Kum Shu, father of Loo Kern, present manager of the Chinatown office of the telephone company.

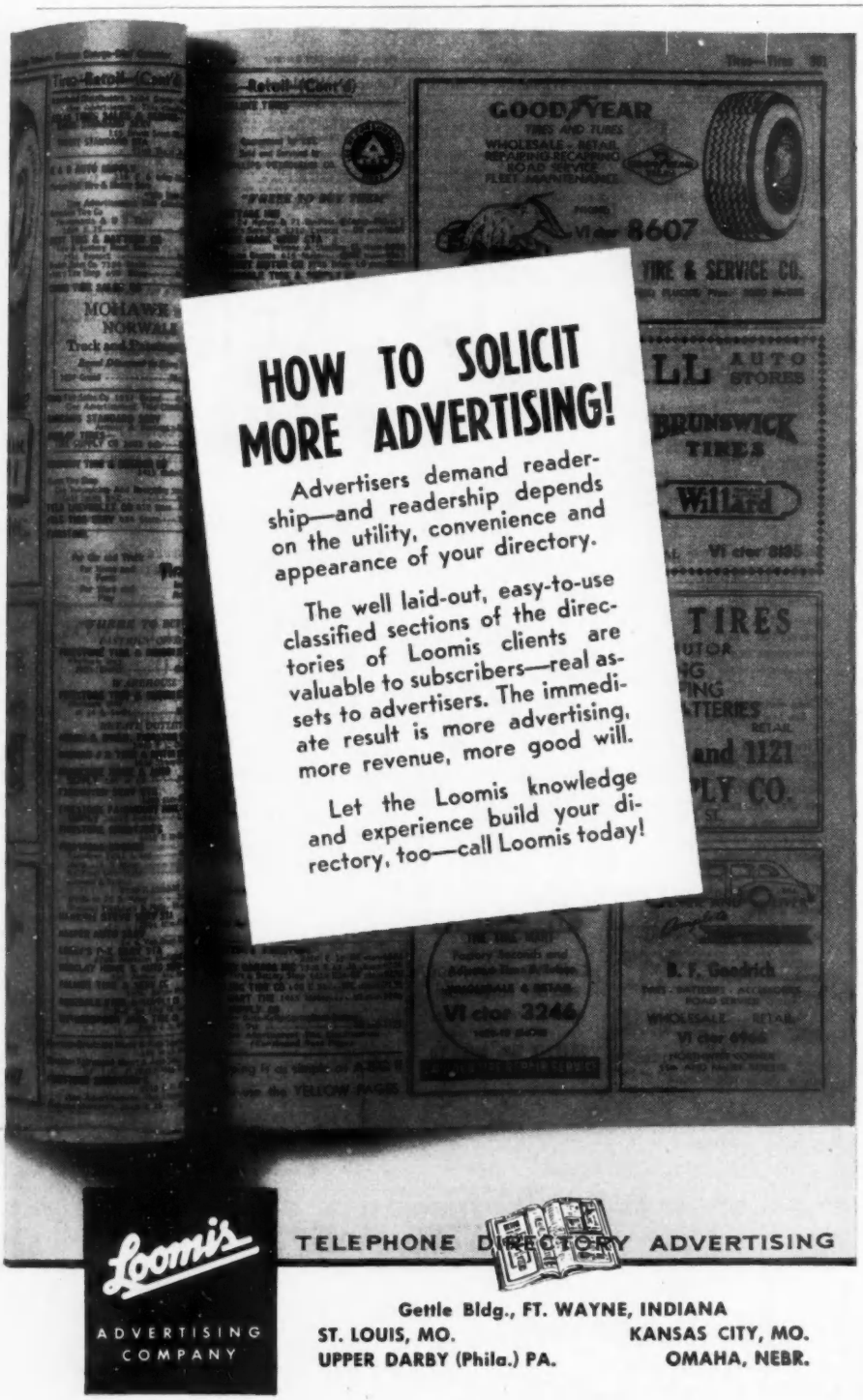
For nearly 20 years prior to that date, while the telephone was well established elsewhere in San Francisco, it was necessary to send runners from the company's Bush street office into Chinatown when calls came for merchants there. The new thing was regarded by many with disfavor, as a device akin to evil, and to be avoided.

But the telephone's popularity grew in Chinatown as elsewhere. And, after the fire of 1906 destroyed the original exchange, the present one was erected in 1909 and was given three pagoda roofs to denote its importance and dignity.

Employment there as an operator became a mark of standing in the community, and, as such, was passed on from parent to child. Original operators were men, who wore their queues coiled atop their heads to avoid entanglement with switchboard cords. They now are women, daughters and granddaughters of the pioneers.

They must be accomplished linguists, speaking not only English, but the five Cantonese dialects prevalent among San Francisco Chinese. When their services no longer are necessary as operators, they will be offered other employment by the company.

The picturesque building for nearly 40 years a San Francisco tourist mecca, will remain as it is, serving as a sub-office for the telephone company.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A HANDBOOK for Telephone Men

INDEX: Open Wire Construction
DATE: January 15, 1949

SUBJECT—Stringing Sags For Ordinary BB And High Strength Steel Line Wire

TABLE 2—Stringing Sags For HTL 85 Telephone Wire (No. 12 B.W.G.) In Same Spans With Galvanized B.B. And Hard Drawn Copper Wire

Heavy Loading Districts—Span Lengths from 100 to 150 Feet
(May also be used in Medium and Light Loading Districts)

Span Length (Feet)	Temperatures in Degrees Fahrenheit											
	100°	90°	80°	70°	60°	50°	40°	30°	20°	10°	0°	-10°
	— Sag in Inches —											
100	9.5	8.5	7.5	6.5	6.0	5.5	5.0	4.0	4.0	3.5	3.5	3.0
110	11.5	10.0	9.0	8.0	7.0	6.5	6.0	5.0	5.0	4.5	4.0	3.5
120	13.5	12.0	10.5	9.5	8.5	7.5	7.0	6.0	5.5	5.0	4.5	4.5
130	16.0	14.0	12.5	11.5	10.0	9.0	8.5	7.0	6.5	6.0	5.5	5.0
140	18.5	16.5	14.5	13.0	11.5	10.5	9.5	8.5	7.5	7.0	6.5	6.0
150	21.5	19.0	17.0	15.0	13.0	12.0	11.0	10.0	9.0	8.0	7.5	7.0

These sags are such that the unloaded tensions at minus 10 degrees fahrenheit equal approximately one-third of the rated breaking strength of BB wire, for all span lengths shown above.

Medium Loading Districts—Span Lengths from 151 to 225 Feet
(May also be used in Light Loading Districts

Span Length (Feet)	Temperatures in Degrees Fahrenheit											
	100°	90°	80°	70°	60°	50°	40°	30°	20°	10°	0°	-10°
	— Sag in Inches —											
151	18.5	17.0	16.0	14.5	13.0	12.0	11.0	10.0	9.0	8.5	7.5	7.0
160	21.0	19.5	18.0	16.0	15.0	14.0	12.5	11.5	10.5	9.5	9.0	8.0
170	23.5	22.0	20.5	18.5	17.0	15.5	14.0	13.0	12.0	11.0	10.0	9.5
180	26.5	24.5	23.0	20.5	19.0	17.5	15.5	14.5	13.0	12.0	11.0	10.5
190	29.5	27.0	25.5	23.0	21.0	19.5	17.0	16.0	14.5	13.5	12.0	11.5
200	33.0	30.0	28.5	25.5	23.5	21.5	19.0	18.0	16.0	15.0	13.5	13.0
210	36.0	33.0	31.5	28.0	26.0	23.5	21.0	19.5	17.5	16.5	15.0	14.5
220	39.5	36.5	34.0	30.5	28.5	26.0	23.5	21.5	19.5	18.0	16.5	15.5
225	41.5	38.0	35.5	32.5	30.0	27.0	25.0	23.0	21.0	19.0	17.5	16.5

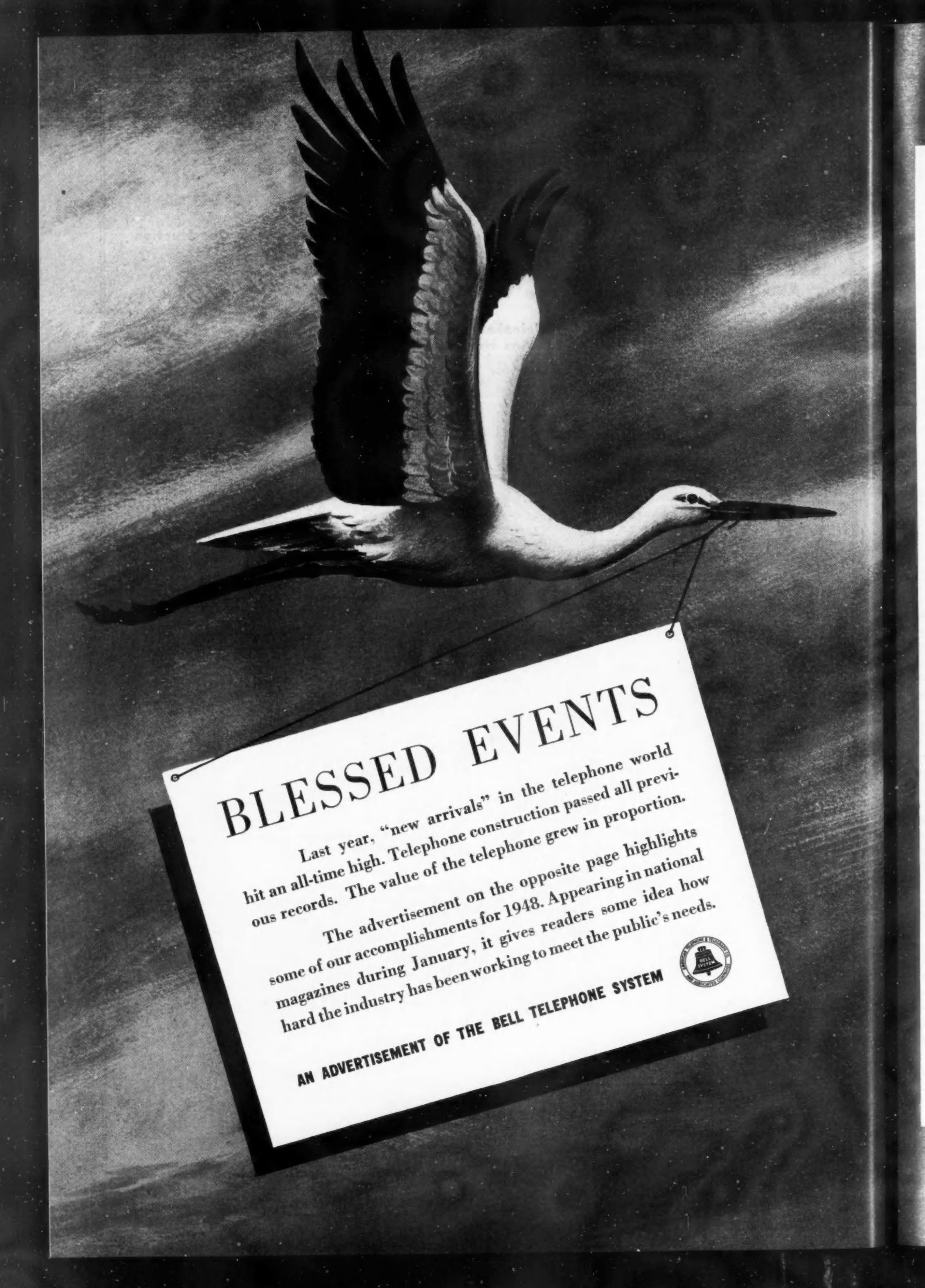
These sags are such that the unloaded tensions at minus 10 degrees fahrenheit equal approximately one-third of the rated breaking strength of BB wire, for all span lengths shown above.

Light Loading Districts—Span Lengths from 226 to 300 Feet

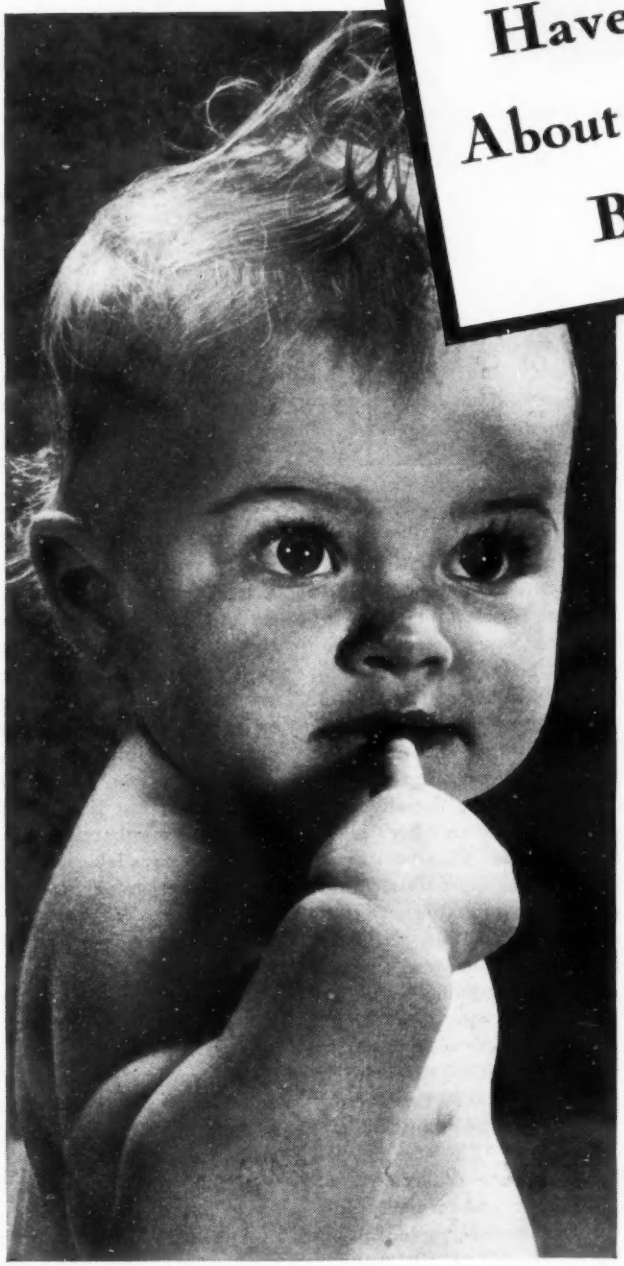
Span Length (Feet)	Temperatures in Degrees Fahrenheit											
	100°	90°	80°	70°	60°	50°	40°	30°	20°	10°	0°	-10°
	— Sag in Inches —											
226	31.5	29.5	27.5	26.0	24.0	22.5	21.0	19.0	17.5	16.5	15.5	14.5
230	33.0	31.0	29.0	27.0	25.0	23.5	21.5	20.0	18.5	17.5	16.0	15.0
240	36.0	33.5	31.5	29.5	27.0	25.5	23.5	21.5	20.5	19.0	17.5	16.5
250	39.0	36.5	34.0	32.0	29.5	27.5	25.5	23.5	22.0	20.5	19.0	18.0
260	42.0	39.5	37.0	34.5	32.0	29.5	27.5	25.5	24.0	22.0	20.5	19.5
270	45.5	42.5	39.5	37.5	34.5	32.0	30.0	27.5	25.5	24.0	22.0	21.0
280	49.0	45.5	42.5	40.0	37.0	34.5	32.0	29.5	27.5	25.5	24.0	22.5
290	52.5	49.0	46.0	43.0	39.5	37.0	34.5	32.0	29.5	27.5	25.5	24.0
300	56.0	52.5	49.0	46.0	42.5	39.5	36.5	33.5	32.0	29.5	27.5	26.0

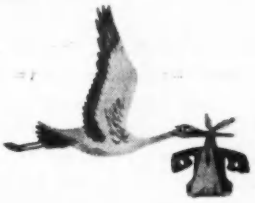
These sags are such that the unloaded tensions at minus 10 degrees fahrenheit equal approximately one-third of the rated breaking strength of BB wire, for all span lengths shown above.

*Copyright 1945 by Indiana Steel and Wire Company.


BLESSED EVENTS
Last year, "new arrivals" in the telephone world hit an all-time high. Telephone construction passed all previous records. The value of the telephone grew in proportion.
The advertisement on the opposite page highlights some of our accomplishments for 1948. Appearing in national magazines during January, it gives readers some idea how hard the industry has been working to meet the public's needs.
AN ADVERTISEMENT OF THE BELL TELEPHONE SYSTEM

Have You Heard About the Telephone Birth Rate?





1948 was a mighty big year for additions to the telephone world.

Your own particular telephone is more valuable today, millions of calls go through clearer and quicker, because of the many things that have been done to extend and improve service.

You can call more people, and more people can call you, because nearly 3,000,000 Bell telephones were added to the telephone population – many in your own community.

Long Distance service is faster and there is more of it because 1,800,000 miles of new circuits were added. A total of $1,500,000,000 was invested in new Local and Long Distance facilities in 1948.

We broke all records for the volume of new telephone construction, the dollars we put into the job and the number of telephone people on the job.

We're going to keep right on working and building in 1949 to make your telephone service a bigger bargain than ever.

BELL TELEPHONE SYSTEM

QUESTIONS and ANSWERS

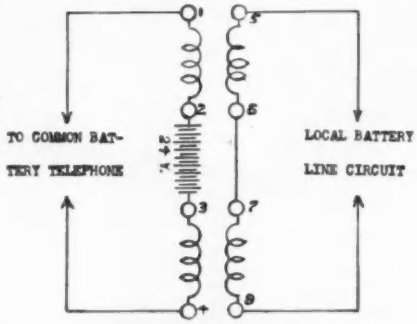
EDITED BY

JAY G. MITCHELL

Q. We noticed in your TELEPHONE ENGINEER magazine that your Mr. Jay G. Mitchell would give free technical opinions in regard to telephone operations. We enclose a stamped self addressed envelope for reply.

We have two propositions that are troubling us. First we purchased two kick coils number C-111 (army surplus) to be attached to a magneto line over which we connected two common battery telephones. The trouble we have encountered is that this arrangement will signal the operator and the telephone will talk but neither will ring if the ringing is divided. Also when the ringers are connected straight to the line the line rings grounded, or the resistance is too great. We wish for you to furnish us with a diagram of just how this circuit should be wired to operate satisfactorily. We are using a 24 volt dry cell battery on this circuit. Advise what is the proper battery to use and whether it will require a charger. Also will the same battery on this circuit supply two or more lines satisfactorily. Our other proposition is to operate a party line, divided ringing, on the above principle by supplying common battery telephones which are common battery signalling and local battery talking. If you will furnish us with complete diagrams and specifications for such an arrangement giving the code number and name of the proper coils to use etc. it will be appreciated.

A. The repeating coil to be used for connecting common battery telephone instruments to a magneto switchboard must be of the ring through-talk through type of course. When properly connected the same battery may be used for more than one line circuit the only critical element being the capacity of the battery in amperes output. When too many line circuits operated by means of common battery telephone instruments and kick coils



COMMON BATTERY TELEPHONE ON LOCAL BATTERY LINE

are served by the same battery the ability of the battery to feed out the required current for talking and for such signalling as may occur at the same time may be exceeded, causing failure to throw the switchboard drop or poor transmission or both. Coils are manufactured by all telephone equipment manufacturers for this service. Such coils are the Leich Electric Sales Company's number 11 B and The Automatic Electric Company's Type 3718, for illustration. In writing any manufacturer regarding repeating coils for this service it should be specifically stated whether the coils are to be used on a long line circuit or on a short one.

I am not acquainted with an army repeating coil number C-111 but the inquiry indicates that it is satisfactory in this service as far as calling in and talking is concerned. The use of kick coils precludes the use of divided circuit calling however and on party lines equipped for this service code ringing will have to be employed. To attempt to furnish divided circuit ringing would involve complications which are not justified in the case of a few stations. Some small telephone companies are using the Signal Corps number 161-C repeating coils for kick coils. These repeating coils have five binding posts and require the installation of a sixth to render them suitable for kick coil service. This is because the 161-C repeating coils are basically simplex circuit coils while the kick coil must afford a method of connecting the common battery between the two portions of one of the repeating coil windings leaving the other winding to be connected to the line in the magneto switchboard. Regularly manufactured kick coils are, of course, provided with the requisite number of terminals. The schematic arrangement is shown in the sketch.

Question:—We are finding that when we run two metallic lines side by side in a lead for a distance that subscribers on one line talking to subscribers on the other line do not seem to get the best results. There seems to be what we think is a choking effect. We have what we call lines 2 and 5. If subscribers on line 2 talk to subscribers on, for example, line 10, the results are very good; but if a subscriber on line 2 talks to a subscriber on line 5, where the lines parallel each other for a distance, the voice transmission seems to be poor. We have checked for all the difference we can think of that might cause this in the switchboard and otherwise. We have done some transposing, but the results are still not satisfactory.

Can you suggest any reason for this condition? Is there such a thing as a choking effect under this situation, and can you suggest a remedy? We shall appreciate hearing from you very much.

Answer:—This inquiry originates with a large telephone company which operates both magneto and common battery telephone systems. While the inquiry does not mention any ringing trouble I am assuming that ringing conditions on both lines 2 and 5 are satisfactory. Of course if the ringing on the two lines or on either of them is also unsatisfactory consistently or occasionally it would be proper to look

for some swinging or periodic condition causing a leak to earth. If the two lines in question are heavily loaded multiparty rural lines with the ringers connected to earth at one terminal it will be very much in order to seek a damaged ringer. Such a ringer could be partially shortcircuited offering, as a result, lowered impedance to earth except when the telephone in which it is mounted is in use. Because of this sort of trouble and for other reasons it is often beneficial to install Vincent Gas Relays at the telephone in series with the ringing circuit when the earth is a part of the ringing circuit but not of the talking circuit. Except when ringing is actually in progress on metallic circuits on which ringing is done via the earth and one line wire the effect of the Vincent Gas Relay is to offer a very high impedance to voice carrying current. This practically eliminates the leakage of voice carrying current that **might occur** at the telephone instruments through the ringers connected to the circuit.

The inquiry states that all possible and ordinary causes of the trouble have been checked. This covers such things as dusty protector blocks, damaged repeating coils (each phantom repeating coil should be provided with its own protector and an individual ground), drop wires that have deteriorated and should be renewed and moved away from any possible rubbing contacts, excessive tree contacts, and exhausted batteries (in local battery telephones). It is also assumed that the line wire is free from poor joints and that the lines are not carried through a long length of high loss cable. If the construction is new the cable should be rechecked to make sure that its mutual capacity is not too high for good transmission.

Finally the circuits should be checked, if they are carried through cable, to make sure that they are not, either or both, on **split pairs.** If spare cable pairs are available it might be worth while to change both of the troublesome circuits to other pairs which are positively known to be good. In attempting to analyse a condition like this at long range it is possible to do little more than make an informed guess. For that reason it would be appreciated if you would write me again and give me the results of your further investigation.

(Q.) What should the resistance be for Cook, Western Electric and Reliable fuses of one half, five and seven amperes? How much variation is allowable?

Free Help on Problems

IF YOU'D like Jay G. Mitchell's technical and helpful opinion on some question, a postcard will bring you a reply in these columns. Or if you're in a hurry, please send along a stamped self-addressed envelope for immediate reply.

Let TELEPHONE ENGINEER tackle your problems when you do not have the answer. This is a free service. Your question and the resulting answer may not only solve your problem but also help the many other telephone men reading these columns.

(A.) So far as is generally known the resistance of fuses to coordinate their operative capacity with their resistance has not been tabulated. The important characteristic of all fuses and especially those employed in telephone circuits is that they operate to disconnect the equipment which they are to protect when a current of known destructive strength flows in the circuit. The operation of any fuse depends upon the temperature of the ambient air somewhat. In extremely cold weather, for illustration, a so-called seven ampere fuse will carry a larger current for an ascertainable period before blowing than the same fuse would carry when the ambient air is of higher temperature. The difference is, of course, a small fraction of a second. Now a satisfactory telephone fuse has been found by experience to be one that will operate to positively open the circuit before equipment can be damaged when abnormally strong currents are passing through it. It is my opinion that when the current in the circuit is fifty per cent greater than the rating of the fuse that the fuse should operate instantly even when exposed to the lowest temperature. A seven ampere fuse should operate practically instantly and open its circuit therefore when the current passing reaches a strength of ten and one half amperes. For this reason the use of low rating fuses is not advised, except in unusual circumstances because they will often interrupt communication for currents which, for a few seconds could do no harm. This line of reasoning does not apply to many types of fuse protection but only to telephone circuit fuses. Fuses such as those intended to protect thermo-couple electric measuring instruments, for illustration, must be selected under more rigid specifications.

can hurt

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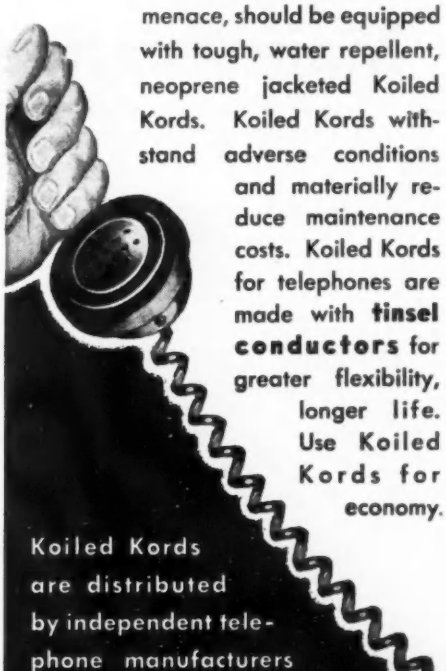
Tropical humidity, steamy plants, sudden rain squalls . . . none of these things can hurt Koiled Kords. Telephones located wherever moisture is a menace, should be equipped with tough, water repellent, neoprene jacketed Koiled Kords. Koiled Kords withstand adverse conditions and materially reduce maintenance costs. Koiled Kords for telephones are made with **tinsel conductors** for greater flexibility, longer life. Use Koiled Kords for economy.



Koiled Kords are distributed by independent telephone manufacturers and suppliers and, on the West Coast, by the Jewell-Summer Co., Los Angeles, Cal.

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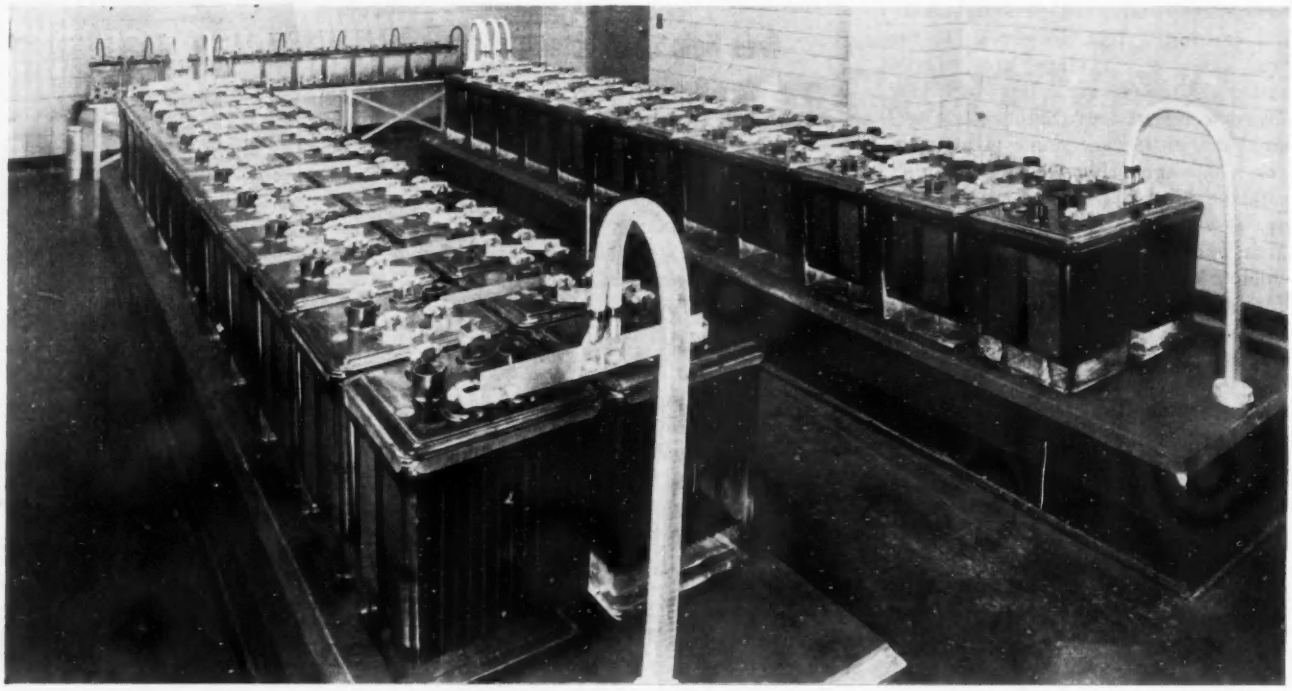

Typical battery installation.

Maintenance of Storage Batteries

In Modern Telephone Systems

K.A. Vaughan.

Manager Field Engineering
Gould Storage Battery Corp.

STORAGE BATTERIES serve two principal functions in the operation of telephone systems: (1) to supply emergency current in case of motor generator, rectifier, transformer or power failure and (2) to furnish current for transmitting, signaling, switching, and various miscellaneous services. Thus, the storage battery, in addition to performing day-in-day-out service, can mean the difference between an operating or non-operating system at a time when rapid communication is of the most vital importance.

The installation and maintenance of the storage battery is simple, However, recommended procedures must be adhered to carefully if reliable operation and maximum battery life are to be assured.

Before discussing installation and maintenance it will be well to devote a few lines to the general technology of storage batteries in telephone systems.

Telephone message transmission and automatic switching mechanisms are operated on DC current. This current may be supplied by a motor generator or by a transformer and rectifier. The transformer, of course, steps down voltage from AC supply lines and the rectifier changes the AC to DC and supplies the circuit with the required current. When a motor-generator is used, the motor runs off an AC power line and turns a DC generator to supply the required current. The storage battery comes into play when the main power supply, the motor generator, or the transformer or rectifier fail.

Normally, when all current is supplied by the motor generator or rectifier, batteries are either being charged by the motor generator or rectifier, or being maintained in a fully charged condition. Thus, an automatic system supplies emergency demands with little attention from telephone personnel.

Voltage required by the system will depend, of course, on the resistance in the connecting circuit. In turn, the voltage will determine the number of cells in any one battery installation.

So much for the preliminaries on the function of the battery. Now for the actual installation and maintenance recommendations.

From the above discussion, it will be seen that once the battery is installed, with rare exception, it would never be removed from service during its life.

Installation Procedure

The battery can be installed in any available location, provided it gets some ventilation and not too much

heat. It should not be exposed to the direct rays of the sun, nor should it be near steam pipes, radiators, or other heat-generating equipment. A warm battery tends to self-discharge at an accelerated rate which not only increases the load on the power source to keep it fully charged, but tends also to shorten battery life. When installed without a rack, enough space should be allowed above the battery to permit water to be added and hydrometer readings to be made.

Before unpacking the battery, the battery rack should be put in place. The battery rack should be so located that all cells are easily accessible for maintenance purposes. The rack should be leveled so that it sets firmly. In addition, it should not be grounded. It should be insulated from the floor, and when two or more racks are installed they should be insulated from each other.

When uncrating a battery the usual precautions necessary when unpacking glassware should be taken (batteries used in signal systems have either glass or rubber jars). Remove the top and sides of the boxes in which the cells are shipped and slide the cells or trays out of packing boxes. Do not lift cells by terminals. Lift them by supporting from beneath.

In installing a battery:

(1) Have all cells located on the rack before making any connections.

(2) Clean all contact surfaces and coat with a thin film of vaseline or other non-corrosive grease. The cell terminal may be cleaned by using a wire brush. Lead-plated copper connector contact surfaces may be cleaned using No. 00 sand paper or a suede brush. Care should be taken not to remove the lead plating.

(3) Locate the cells in a straight line in the center of the rack. Start in the center of the row and put connectors in place (positive to negative) lining cells up with a cord. Check all connections to determine that polarity is correct and that no cells are installed in reverse. A voltmeter may be used as a final check. The overall battery voltage should equal two times the number of cells in series.

(4) After installing fully-charged batteries, make sure that all connections are tight; that each cell is properly connected; that the electrolyte is at the high level mark.

(5) The positive terminal of the battery must be connected to the positive side of the system and a negative terminal of the battery to the negative side of the system. A suitable scale voltmeter should be used to check the polarity of the system and battery.

GOULD BATTERY RECORD CARD FLOATING BATTERY SYSTEM Form 850

Location No. _____ Used for _____

Type and Size of Battery _____ Date Installed _____

Rectifier: Type _____ Serial No. _____ Date Installed _____

Year 19		Individual Cell Voltages and Gravities Take Readings With Battery Charging From Rectifier CELL NUMBER 1	2	3	4	5	6	Average Cell Temperature	Constant Load from Battery	A. C. Power Supply	Rectifier* Output in Milliamperes		Quantity Water Added	Remarks
		Fully Charged Specific Gravity **												
Date	Volts									Voltage	Found	Left		
	Volts													
	Gravity													
	Volts													
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* Measure and record rectifier output only before and after any change in the adjustment that may be required, i.e., either increasing or decreasing the output. Cell voltages should be recorded before making any change in the rectifier adjustment.

** After a new battery installation has first been brought to its fully charged condition with the high rectifier setting take a specific gravity reading of the electrolyte of each cell and record at the top of this card directly under "Fully Charged Specific Gravity". Also include average cell temperature. This will provide a record of the fully charged specific gravity for each cell against which future readings may be compared

GOULD STORAGE BATTERY CORPORATION . . . . Depew, New York

Printed in U. S. A.

Record form for keeping history of battery maintenance and performance. One-half actual size.

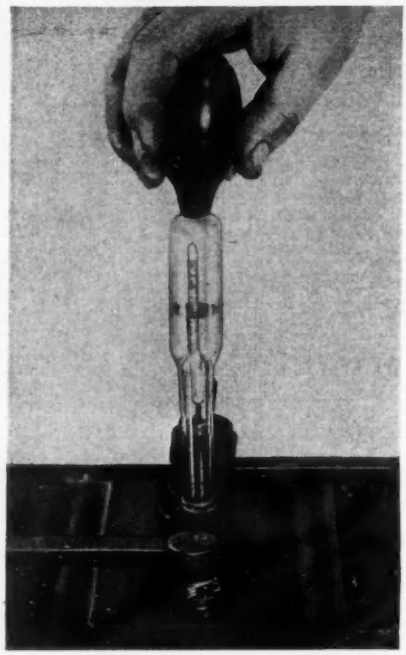
As to maintenance, individual cell voltages should be read and the readings recorded every three months. If one or more cells are more than 0.05 volts below the average voltage of the battery, the specific gravities of all cells should be noted for record and the battery given an equalizing charge (an additional charge to bring the low-reading cell or cells up to average). This is usually accomplished by charging (i.e., passing current through the battery) until there is no increase in the specific gravity of the cell in question over a three-hour period.

If cell voltages are uniform, specific gravity readings need not to be taken and recorded more than once a year.

The addition of water to the battery cells has a very important bearing on their performance. Installations operating under well-regulated conditions do not need water more than semi-annually and this period may even extend to a year before electrolyte levels drop below the low level mark. When adding water, the high level mark should not be passed, as subsequent gassing when fully charged may cause cell tops to become wet. The level should always be maintained between the high and low-level mark on the jars.

If electrolyte levels are allowed to fall below the tops of the plates all such exposed areas become inactive, putting excessive loads on the submerged portions. Loss of battery life results. Furthermore, exposed portions of the wood separators tend to dry out and shrink with the result that internal resistance increases and voltage during discharge suffers.

Ordinary tap water often contains impurities injurious to batteries and should not be used unless it has been checked. Most battery manufacturers will analyze water for their customers and advise whether it is satisfactory. To be on the safe side, distilled water should be used unless it is certain that tap water is suitable. Sometimes it may appear that cer-



Attendant checking specific gravity with a hydrometer. Signal battery readings need not be taken more than once a year unless cell voltages are more than 0.05 volts below the average voltage of the battery.

tain cells need acid rather than water as they may seem to be consistently low in gravity when fully charged. The addition of acid is rarely necessary however, since in normal operation it is not lost from the cells. Only in case of spillage, excessive charging which causes considerable spraying of acid, etc., can it be lost. It is best to call on the manufacturer's representative for advice if it is felt that an acid addition is required.

If for any reason a lead-acid battery stands idle before installation or is removed from service for any length of time it should be given an equalizing charge. This charge should be repeated monthly during the idle period. The battery should be given a thorough equalizing charge before being returned to service.

Collections

(Continued from page 30)

ment, but if they do not, then service is denied when necessary for the purpose of limiting losses.

Once service is disconnected, we have the difficult problem of collecting final bills. Generally speaking, it is easier to collect bills when the account is active than after it has gone into a final bill. When disconnect orders are received, it is helpful to collect the amount due if possible, and if a final bill is going to be rendered, it is very important to get good information as to the customer's future location and mailing address.

Final bills should be reviewed promptly upon rendition, so that appropriate action can be taken without loss of time. This action usually consists of follow-up by mail, by collector's visit and in some cases, by legal action. We often get help in locating the debtor by scanning the toll tickets and contacting the distant point.

A third step indicated is to train and retrain our people, for it is not enough to train new employees, but it is necessary to keep on with continuation training for many months to produce a skillful and effective collection employee. It is important for the employee to have the proper viewpoint. They must know our collection objectives and the reasons for them. They must be thoroughly familiar with our collection practices and the reasons behind the practices. They must be trained to give individual consideration to each case. They must develop judgment and resourcefulness. They must learn to promote good payment habits. They must be taught the right attitude, to be businesslike and firm when necessary, but always courteous, respectful and considerate. They must be given a sense of the employee's responsibility for good results and their enthusiasm should be constantly encouraged.

Last, but not least, Management has a vital part to play. As in any job, good results depend upon careful planning, upon organizing to do the work, upon training and supervising the employees, upon measuring progress and upon furnishing the necessary leadership.

Mark Twain used to say, "Put all your eggs in one basket and watch that basket." The collection basket contains some golden eggs, and it will pay us dividends to watch it.—*(Address presented at the* 1948 *convention of the Virginia Independent Telephone Association.)*

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and we are just
awakening
to the fact, that
in this new year
just starting
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for
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News Briefs

(*Continued from page 26*)

lounge and other rooms and offices. It is designed not only to accommodate present needs of the company but to handle future expansion. The facilities will allow room for an eventual installation of 14 toll positions in contrast to the five positions now operated. It is expected the building will be ready for occupancy by next July.

Charles H. Joy Joins Fairmont, (Minn.) Tel. Co.

Charles H. Joy has resigned his position as assistant district manager, Bloomington District, with the Illinois Telephone Co., to become associated with the Fairmont Telephone Co., Fairmont, Minnesota. Mr. Joy graduated from Streater High School in 1934, and was hired by the Illinois Valley Telephone Co., Streator, as a service salesman. He continued his work in Streator until March of 1936, when he was given the title of commercial assistant. In February, 1938, he was transferred to the accounting department to gain experience in this work.

In November of 1938, Mr. Joy was transferred to Roodhouse, Illinois, as district manager. There he supervised plant, traffic, accounting and commercial activities for a number of exchanges in that district.

On December 1, 1942, he was made manager of the Pontiac exchange, then the Automatic Home Telephone Co. This position he held until he was inducted into the Army on July 9, 1945. During World War II, he served in the Finance Department in the European theater of operations.

On August 16, 1946, Mr. Joy returned from his services with the Army, and was made assistant district manager at Bloomington, which position he held until his resignation.

Cutting Down | On Eavesdropping

COMPANIES HAVING trouble on rural party lines due to the propensity of subscribers to listen whenever the bells ring can get some relief on outgoing calls by use of the "secret signalling arrangement". This is simply a single pole, double throw, pushbutton installed in the telephone and wired to the generator as shown in *Fig.* 1. The central office drop must be disconnected from across the line and one side grounded.

To call central the subscriber presses the button which signals the operator without ringing the bells of any other subscribers. This arragement is

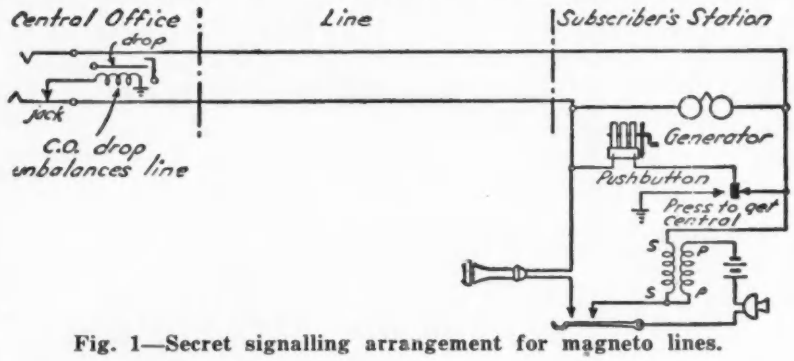

Fig. 1—Secret signalling arrangement for magneto lines.

particularly effective from the standpoint of outgoing long distance calls and the improved transmission resulting from fewer "eavesdroppers" makes for more satisfactory toll service.

If the rural line on which this arrangement is used is heavily paralleled by power lines it may be necessary to install a gaseous type tube in series with the central office drop to prevent the grounded drop from unbalancing the line.

The secret signalling system can be used with a more complicated type push button which permits the central office drop to be placed at the electrical mid-point of the line by means of a center tapped retard coil (*See Fig.* 2). The

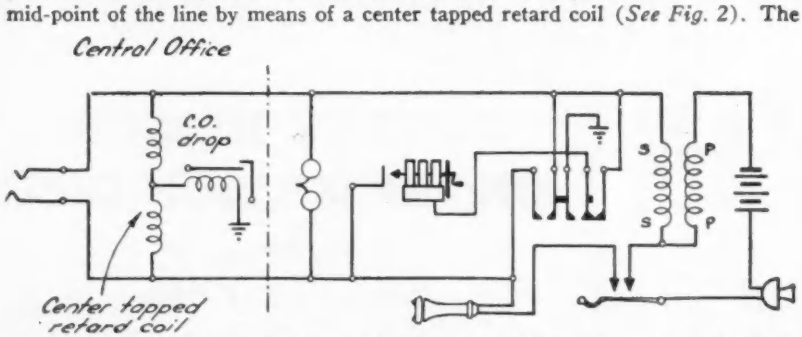

Fig. 2—Method used where paralleling power lines create noise with grounded C. O. drop.

push button has extra contacts which not only ground the generator, but also short the line when a subscriber operates the button. This prevents cross ringing. This arrangement should be used if heavy parallels with power lines are involved.

Covina, Calif., Converted To Automatic Operation

The second major automatic conversion for Associated Telephone Co., Ltd., during 1948 ocurred at midnight, November 20, when the Covina exchange, including central offices in Covina, Baldwin Park, Azusa, Glendora, and Puente were cut over from manual to automatic operation. With some 6,915 stations already in service, conversion made possible the immediate installation of 1,400 additional telephones in the 120 square mile area.

Modern design buildings were constructed in the five areas to house the new central office equipment. In addition to the years of planning and engineering, appriximately 165,000 manhours of construction and installation and $2,133,000 were expended on the conversion.

Preceding the cut-over, officers and local representatives of the Associated Company, city officials, officials from other utilities and civic organizations and members of the press were guests at a dinner presided over by J. W. Johnson, manager at Covina.

Speaker of the evening was Edwin M. Blakeslee, president of the company, who mentioned some of the problems which had arisen and been overcome in preparation for the conversion, and gave a brief explanation of the universal numbering system which determined the prefix of the new telephone numbers in the area.

(*Please turn to page* 56)

They have what it takes

TELEPHONE LINEMEN have the traditional Bell System spirit of service that aims to "get the message through." They also have what it takes *in the way of equipment and supplies.*

Their wires, cables, poles, tools and countless other things are provided by Western Electric—maker or supplier of practically everything used in your telephone service. We carry stocks of 31,000 different items to help all Bell telephone people, not only to do their daily job of maintaining and expanding telephone facilities but also to meet sudden emergencies.

• Western Electric has been a part of the Bell System for many, many years—ever since 1882. Our people share in the System's spirit of service. We, too, are always ready to answer the unexpected hurry call—to help "get the message through" for you.

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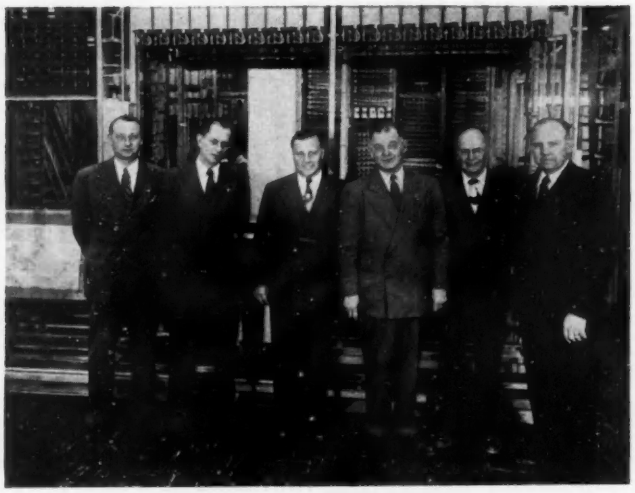
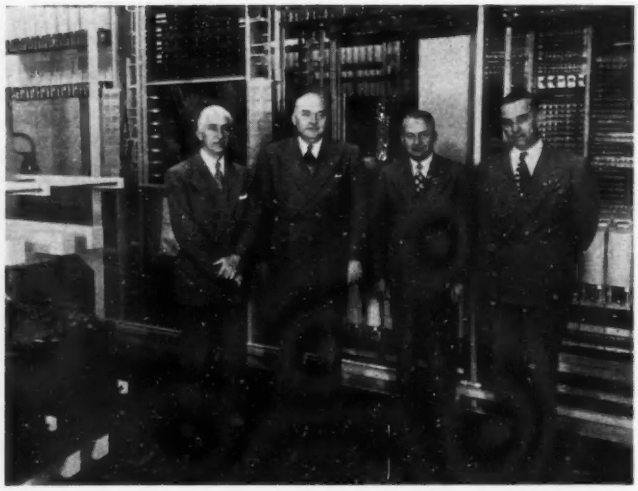
A UNIT OF THE BELL SYSTEM SINCE 1882





Photographed at Covina cutover (l. to r.): J. A. Rector, Automatic Electric Co.; J. T. Ernst, eastern district equipment superintendent; M. L. Markey, Automatic Electric Co.; C. M. Davis, general equipment engineer; George Linton, general equipment construction supervisor; H. C. Smith, Automatic Electric Co.; H. W. Holmwood, vice president of Associated Telephone Co., Ltd.; Edwin M. Blakeslee, president; Carl Von Hake, district manager, and J. W. Johnson, Covina manager.

The only two remaining directors of the original Covina telephone company reminisced about telephone service in the 1890's and Carl Von Hake, Eastern district manager, spoke of some of the problems of converting five central offices simultaneously and gave a brief resume of what would occur later in the evening.

Henry Rossner, Eastern district equipment supervisor, who had direct supervision of equipment installation in the new offices, gave dinner guests a demonstration of a miniature dial office.

The first calls from the various offices were decided upon by drawings and made by the mayors of the five cities. At 10:30 guests were guided through the new Covina automatic office and toll office before they separated into community groups to witness the cut-over at the five separate central offices. The conversion occurred promptly at 12 o'clock.

The new automatic equipment was cut-over to serve 1000 lines and 1900 normals in Azusa, 1600 lines and 3200 normals in Baldwin Park, 1400 lines and 3100 normals in Covina, 600 lines and 1400 normals in Glendora and 800 lines and 1600 normals in Puente.

The new equipment in all five offices is of the standard Strowger step-by-step type, using Strowger line finders, selectors, and connectors. In all

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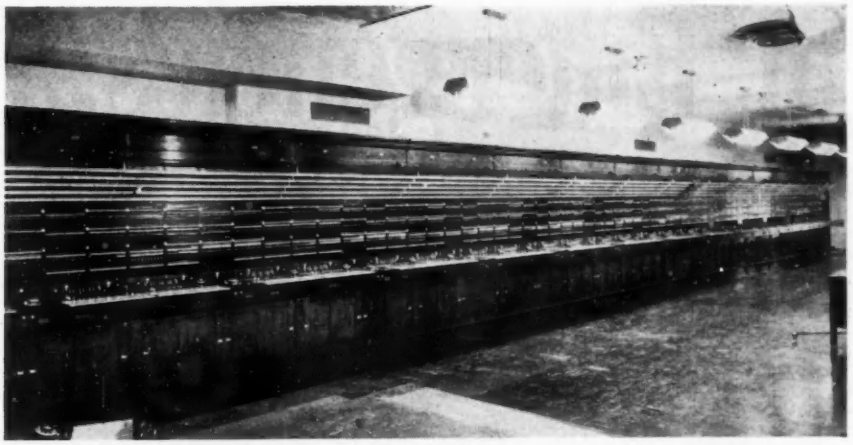
offices switches are mounted on 11 foot 9 inch racks.

In addition to the standard dial equipment in each office, there was also installed in the Covina main office a two position test desk, a four position card type information and intercept desk and a 33 position Automatic Electric Company Type 3C high type toll switchboard.

All equipment was engineered and installed by personnel of Associated Telephone Company, Ltd.



New 33-position toll switchboard in Covina was cut into service simultaneously with the automatic conversion.

Garland Foscue, Jr., Named V. P. Consolidated Tel. Co.

Resignation of E. G. Stephenson as vice president and general manager of the Consolidated Telephone Co., Florence, Ky., effective January 1, has been announced by G. B. Foscue, Wilmette, Ill., president of the company.

Mr. Stephenson some time ago made known his plan to leave the telephone operating field to establish a consulting and construction service for Kentucky Independent telephone companies, particularly the smaller ones, which service he opened on January 1.

Mr. Stephenson was succeeded by G. B. Foscue, Jr., who for three years has been associated with the Southwestern States Telephone Co., Brownwood, Tex., as traffic superintendent.

Mr. Stephenson began his telephone work in 1928 when he became an apprentice lineman for the Consolidated Telephone Co. In 1930, he was transferred to general service and installation work and, in 1933, he was appointed plant superintendent. In 1935 he was named manager of the company.

In 1938, Mr. Stephenson was placed in charge of the conversion from magneto to common battery operation of the Irvine and Ravenna exchanges of the company, which included construction of a new central office building, installation of new central office equipment, and rehabilitation of the outside plants. In 1940, he returned to Florence as manager of all the company's properties until the spring of 1947, when he was elected vice president and general manager.

Mr. Stephenson was active in the formation of the Kentucky Independent Telephone Association in 1933 and has served as an officer and director. At present he is vice president and a director of the association.

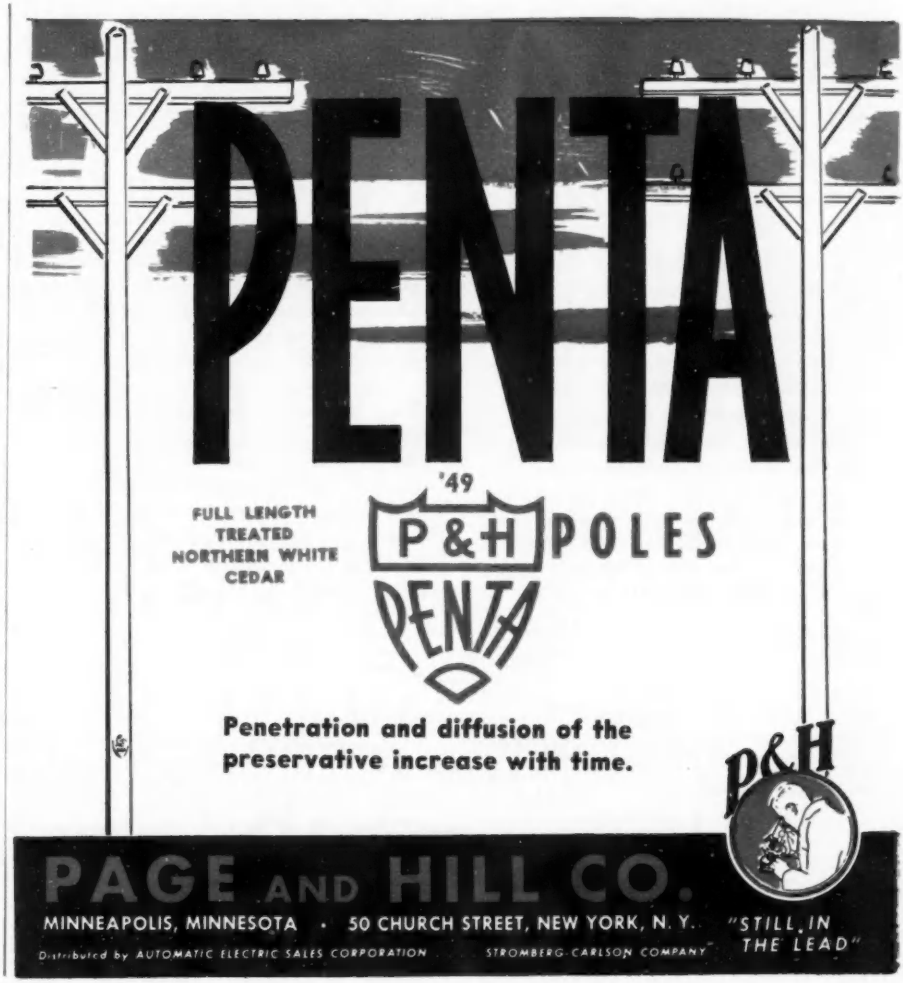
Mr. Foscue, Jr., became associated with the telephone industry in July, 1935, following his graduation from Lehigh University, when he joined the staff of Telephone Management Co., Fort Wayne, Ind., a unit of the Gary Group. In September, 1935, he was transferred to Kansas City and was elected secretary-treasurer and a director of several Gary operating companies.

Mr. Foscue, in February, 1939, joined the Texas Telephone Co., Sherman, Tex., as assistant general manager. In August, 1945, he accepted the position of manager of the Dyersville district of the Iowa Telephone & Telegraph Co., having general supervision over all the departments of 12 exchanges.

He resigned from that position in February, 1946, to become traffic superintendent of the Southwestern States Telephone Co.

Mt. Pleasant (Wis.) Company Abandons Facilities

The Mt. Pleasant (Wis.) Telephone Co., Monticello (Green County) was recently authorized to abandon facilities. The company's 33 subscribers will be serviced by the United Telephone Co., Monroe, Wis.



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W. C. Henry & Loren Berry Elected Directors of Kellogg

A special meeting of the shareholders of Kellogg Switchboard & Supply Co., Chicago, Ill., on December 20, resulted in the election of two new directors and reelection of four present directors under a plan which classifies the 9-man Board of Directors into three groups of three each and provides for three year terms.

The directors elected and their respective terms are:

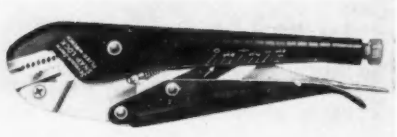
For term expiring at the annual meeting to be held March 28, 1950: S. Ashley Guthrie, William C. Henry, and Claude D. Manning.

For term expiring at the annual meeting to be held March 27, 1951: Loren M. Berry, John J. Bryant, Jr., and Harry C. McCluskey.

James G. Kellogg, James H. Kellogg and John P. Hooker, who were elected at the 1948 annual meeting and who are remaining on the board, will continue to hold office for the term for which they were elected, until the annual meeting on March 29, 1949. Their successors will be elected at that meeting for 3-year terms.

"Snap-Lock" Plier Wrench Announced By Seymour Smith

Three new features introduce the improved "Snap-Lock" Plier-Wrench now being offered by Seymour Smith & Son, Inc., Oakville, Conn. A new lock release, operated by the touch of a finger, opens the jaws immediately freeing the work held there by the powerful toggle action. This readies the plier-wrench for the next job.



New "Snap-Lock" plier wrench is available in two sizes: the 10-inch for extra heavy duty, and the 7-inch for smaller requirements.

A capacity indicator scale, embossed on the upper handle, shows the extent of the jaw opening as the adjustment screw is turned. The plier-wrench can be pre-set to any desired jaw opening for production operations. The calibrated capacity indicator also eliminates guess work in adjusting the plier-wrench to hard-to-reach bolts, nuts, studs, etc.

The third feature of the new model is an improved swivel jaw, with a wider arc. This enables the "Snap-Lock" to grip irregular shaped pieces firmly, even when opposite sides of the work

are not parallel, or so smooth that the ordinary plier could not hold fast.

Made of pressed steel, and strongly reinforced at extra wear points, the new "Snap-Lock" is a tool of great power requiring only ordinary hand strength. When the jaws are adjusted to the work, and then locked by pressing handles together, the grip is infinitely more powerful. This locked position enables the plier-wrench to be used as a vise or clamp. Unlocked, the "Snap-Lock" serves as a superior type plier.

Ben H. Bear Joins L. M. Berry & Company

L. M. Berry & Co. has announced the appointment of Ben H. Bear as directory engineer, with headquarters in Dayton, Ohio. Mr. Bear's work will place emphasis on improved directory advertising sales technique and market development.

Prior to joining L. M. Berry & Co., Mr. Bear was associated for 40 years with the Southwestern Bell Telephone Co. where he progressively served as

BEN H. BEAR

installer, assistant wire chief, contract agent, special collection agent, district manager, stock sales supervisor, commercial supervisor and general directory manager.

For the past 21 years Mr. Bear has been closely identified with many of the outstanding achievements and contributions made by Southwestern Bell to better directory sales and production activities—experience which fits him ideally for his new work with L. M. Berry & Co.

During the first World War, Mr. Bear served in the Signal Corps with the American Expeditionary Forces in France. After the War he assisted in the installation and maintenance of the telephone service for the American Commission to Negotiate Peace at the Crillon Hotel in Paris.

Gould Inaugurates Schools On Battery Use and Care

A series of practical one-week "schools" to teach better techniques of storage battery maintenance and repair to foremen, supervisors and engineers in those many industries which employ lead-acid batteries for motive power, standby or direct current supply, was inaugurated recently in Trenton, N. J., by Gould Storage Battery Corp.

So successful was the first session that, according to M. W. Heinritz, vice president, future five-day schools will definitely be conducted by Gould for coal and metal mining groups, as well as for classes interested in (1) battery-powered lift trucks and material handling systems, (2) telephone and other communications systems, (3) railway car lighting, diesel starting and air conditioning, and (4) transportation signal work.

In order to handle the schools, Gould has set apart one large laboratory and office at its Trenton plant, fitted them with standard classroom equipment, purchased special test and charging equipment and tools, and prepared numerous displays to help the lectures. The lectures given at the first school covered: storage battery theory, battery design, electrical theory, battery layout, charging methods, maintenance procedure, evaluating secondary haulage, and handling batteries underground. The laboratory projects and demonstrations for attendees included: assembling a complete cell and rebuilding a battery; charging batteries by different methods and setting up charging controls and schedules; repairing damaged batteries with proper tools and correct carbon-arc burning technique; and an inspection tour of Gould's battery manufacturing facilities.

One of the most noteworthy aspects of the new series of Gould Battery Schools will be their stimulation of better internal company training programs on battery care and use.

To help further, the Gould Field Engineering Staff will periodically contact each "graduate" to volunteer help, advice and additional data—to keep each company training program continuous and up-to-date.

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Second edition, 652 pages, 6x9, 682 illustrations, $5.00

This book familiarizes you with every component of transmission lines—electrical fundamentals and electric circuits, the electric system from generation to distribution, even a chapter showing how transmission lines are designed. Descriptions of all the materials of line construction; poles, conductors, hardware, tools, electrical apparatus, etc., are also supplied. With this sort of background, every line of the chapters on construction, testing, and maintenance that follow are twice as valuable.

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ALPHADUCT WIRE & CABLE CO.

Milltown, New Jersey Telephone: Milltown 8-0030

Notebooks to students along with pertinent reference data, charts and diagrams. Thus, an unusually complete and authoritative file of information on battery maintenance, charging and repair becomes the permanent property of each student. Executives of industrial firms interested in sending key maintenance personnel to future Gould Battery Schools should correspond with James A. Gilruth, school director, Gould Storage Battery Corp., Trenton, N. J., for arrangement of dates and subject emphasis.

Col. E. L. Love Advanced By Whitney Blake

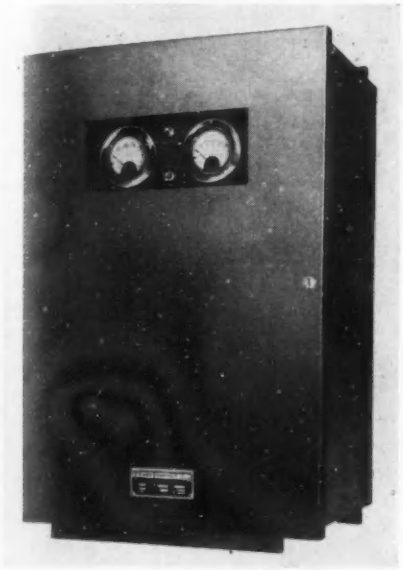
John Brown Cook, president of the Whitney Blake Co., and Koiled Kords, Inc., Hamden, Connecticut, has announced that Col. E. L. Love has been placed in charge of all sales promotional and advertising activities of both companies. In addition to his new duties, Col. Love will continue as sales manager of Koiled Kords, Inc., and J. L. Coleman remains in charge of sales of Whitney Blake products.

New Line Of Automatic Floating Battery Chargers

Development of a new line of electronically controlled and regulated floating battery chargers, for power stations, communications and other applications requiring accurate control of floating voltage, has recently been announced by Power Equipment Co. Similar equipment utilizing magnetic controls have also been developed. The company has specialized in the design and manufacture of custom built controlled rectifiers since 1935.

The new standard chargers are fully automatic in operation, have constant potential output, and are designed to maintain floating charge on the battery group to within $\pm$ 1%. This close control of floating voltage, in accordance to battery manufacturers' recommendations, is considered an important factor in determining battery life in as much as it eliminates the deteriorating effects of over- or under-charging. Further, the manufacturer claims the need for addition of water is reduced to about twice a year due to the elimination of excessive gassing. The combination of these factors results in lower maintenance and supervisory cost as well as increased battery life, according to the manufacturer.

Equipment listed in the new standard charger line are built to operate over a relatively wide range of output voltages which permits their use on many different cell combinations. Regu-



60 Cell, 6 ampere power station battery charger. Model No. PEC 512.

lation is said to be accurate over the entire range and is independent of A.C. line voltage and frequency fluctuations.

Electronic overload protection is provided which automatically limits the current to the pre-set maximum value and prevents overloading of the charger by reduction of the terminal voltage below the battery voltage. This permits the battery to carry the load until the peak required has passed.

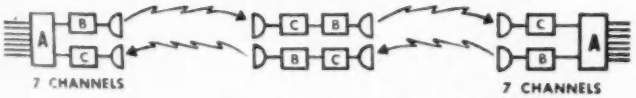
Other design features incorporated in the new line of floating battery chargers include simple compact controls having no moving parts or contacts, conservatively rated selenium rectifier, and convection cooling. In the control circuit, standard commercial tubes are operated below manufacturers' recommended ratings, assuring extended service. There are no critical circuit requirements, according to the manufacturer, and sectionalized construction simplifies servicing and permits variations from standard to meet special requirements. Complete specifications on standard equipments available upon request to New Products Editor, Telephone Engineer Publications, 7720 N. Sheridan Rd., Chicago 26, Ill.

Multichannel Microwave Link Developed By Federal Tele. & Radio

A multichannel FM microwave radio link, known as "Intelink," capable of simultaneously transmitting more than seven two-way telephone conversations, has been developed by Federal Telephone & Radio Corp., Clifton, N. J., manufacturing associate of International Telephone & Telegraph Corp. Combining highly reliable communications with small size, and low initial and operating costs, the manufacturer states this FTL-13-A Intelink should find wide application in railroads, telephone companies, public networks, oil lines, mining companies, and similar organizations.

The application of the "Intelink" to wire transmission systems fall into two general categories, which are: (1) As part of long line telephone systems, in which the link is used to span difficult terrain such as rivers or mountains; (2) as complete point-to-point communication links—initiating and terminating directly in telephone and telegraph instruments and switchboards or other subordinate telephone or telegraph equipment. In this latter case, the manufacturer claims

TYPICAL 7 CHANNEL RADIO COMMUNICATION SYSTEM with one or more intermediate repeaters



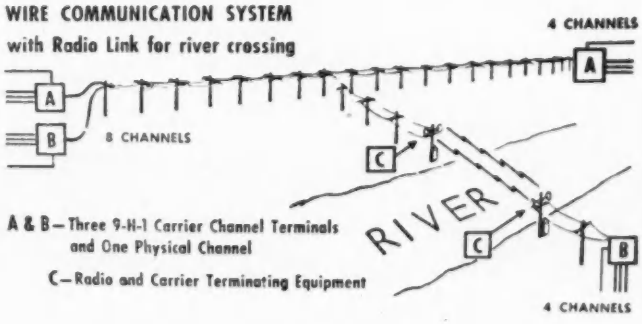
A—Six 9-H-1 Carrier Channel Terminals and One Physical Channel

B—FTL 13-A Radio Link Transmitter

C—FTL 13-A Radio Link Receiver

Typical 7 Channel point-to-point communications system utilizing a FTL-13-A radio link and 6 FTR 9-H-1 carrier channels.

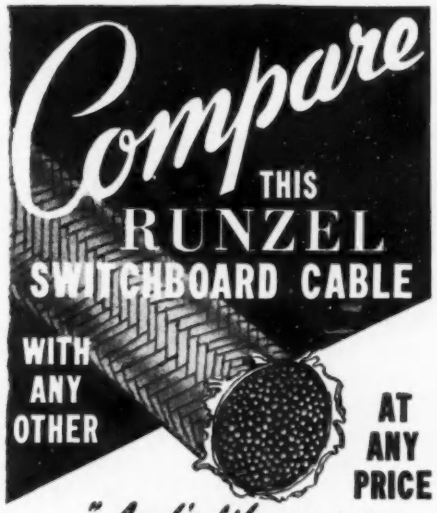
TYPICAL 8 CHANNEL WIRE COMMUNICATION SYSTEM with Radio Link for river crossing



A & B—Three 9-H-1 Carrier Channel Terminals and One Physical Channel

C—Radio and Carrier Terminating Equipment

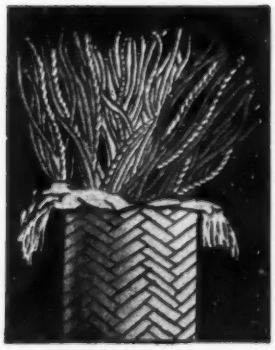
Integration of a radio link into existing wire lines for spanning difficult terrain.



"Looks like every other cable" you'll say!

BUT—

NOW EXAMINE THE WAY IT'S FABRICATED



1. Celanese and cotton insulated
2. Wax saturated
3. Waxed paper wrapped
4. Smooth cotton braid
5. Painted with vermin and flame-proof paint

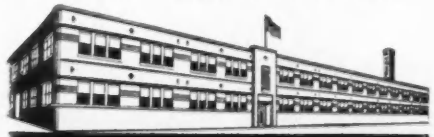
RUNZEL CABLES are oven-baked then wax-saturated to assure absolute moisture-proofing.

True colors and proper waxing aid identification for easy color separation.

For the utmost in clarity of reception use

RUNZEL QUALITY CABLES

Send us your specifications for switchboard and inter-phone cable. Quick delivery.



RUNZEL
Cord and Wire Co.
4723 W. MONTROSE AVE.
CHICAGO 41, ILL.

Crapo

Galvanized Steel* CABLE LASHING WIRE

AVAILABLE FOR PROMPT DELIVERY!

The new *Crapo* Galvanized Steel Lashing Wire (.091-inch diameter) now is available for almost immediate delivery. This improved wire has been developed especially for use with modern cable-spinning machines. It is manufactured from selected steel, carefully processed and heavily galvanized to conform, in every respect, to specifications approved by leading telephone engineers.

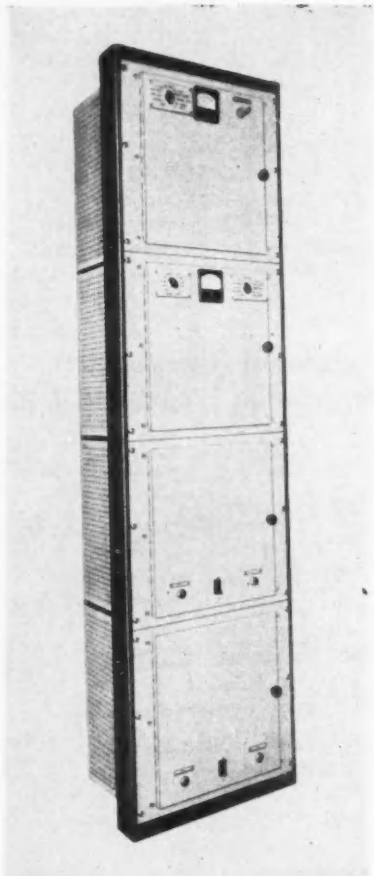
Crapo Galvanized Steel Cable Lashing Wire comes in neat, compact, thread-lay coils containing approximately 325 feet. Packed in cartons of 6 coils each.

Ask your Jobber or write direct!

**Crapo* Cable Lashing Wire also is available in "Stainless Steel," .065-inch and .045-inch diameter.

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA

• • •



Front view of the Intelink FTR-13-A broad band, FM radio link operating in the 900 to 940 Mc Band—showing transmitter, receiver and power supply units.

the use of the FTL-13-A Intelink with Federal's low cost 9-H-1 carrier equipment permits the simultaneous transmission of seven two-way speech channels—with additional facilities available for the inclusion of 14 two-way telegraph channels.

Operating in the frequency range of 900 to 940 megacycles, it is claimed this link meets all the standard requirements of a wire transmission system. Each radio system, comprising one radio transmitter and one radio receiver terminal requiring a single assigned carrier frequency, constitutes a one-way broad band communications circuit. Two such links, operating in opposite directions over the same path on two seperate radio carrier frequencies, provide a two-way circuit adaptable to signal transmission on a 4-wire basis.

The manufacturer states the equipment is capable of transmission of signals in the 200 cycle to 60 Kc range. The transmission quality is sufficient to permit incorporation of these links in line circuit utilizing carrier telephone, telegraph, program and facsimile equipment. More than one link can be used in tandem to increase the line-of-sight range of the Intelink units.

Marmon-Herrington Announces New Heavy-Duty All-Wheel-Drive Trucks

Marmon-Herrington Company, Inc., Indianapolis, Indiana—originators of All-Wheel-Drive conversions for standard, mass-produced trucks—has announced a new line of heavy-duty All-Wheel-Drive converted Ford trucks, identified as the "Q" Series.

There are six models in the new Marmon-Herrington "Q" Series. Three models are 4-wheel-drive, three models 6-wheel-drive. Gross vehicle weight for 4-wheel-drive models is 21,500 pounds, for 6-wheel-drive models 35,000 pounds. Wheelbases range from 136½ inches to 220 inches.

In building the "Q" Series, Marmon-Herrington starts with standard Ford F-7 models. Recently introduced Ford F-7 models are much bigger in all respects than any previous Ford trucks. With normal gross vehicle weight of 19,000 pounds, they are, in

New heavy duty, all-wheel-drive truck.

fact the first true heavy-duty trucks ever built by Ford. All F-7 models are powered by Ford's big new 145 horsepower V-8 engine—the most powerful in Ford history.

In converting Ford F-7 models to "Q" Series All-Wheel-Drive trucks, Marmon-Herrington makes these changes:

(1) Original front axle assembly is removed and new front driving axle installed. This axle has standard Ford differential, ring and pinion gears and is equipped with specially-designed constant velocity universal joint steering ends for safe, easy steering.

(2) New two-speed auxiliary transmission of Marmon-Herrington's own design is installed. This provides a total of ten forward speeds and two reverses. Extremely low final reduction of 89.215-1 assures exceptional tractive power for tough, off-the-road operations.

(3) Necessary changes are made in the steering assembly and brake connections.

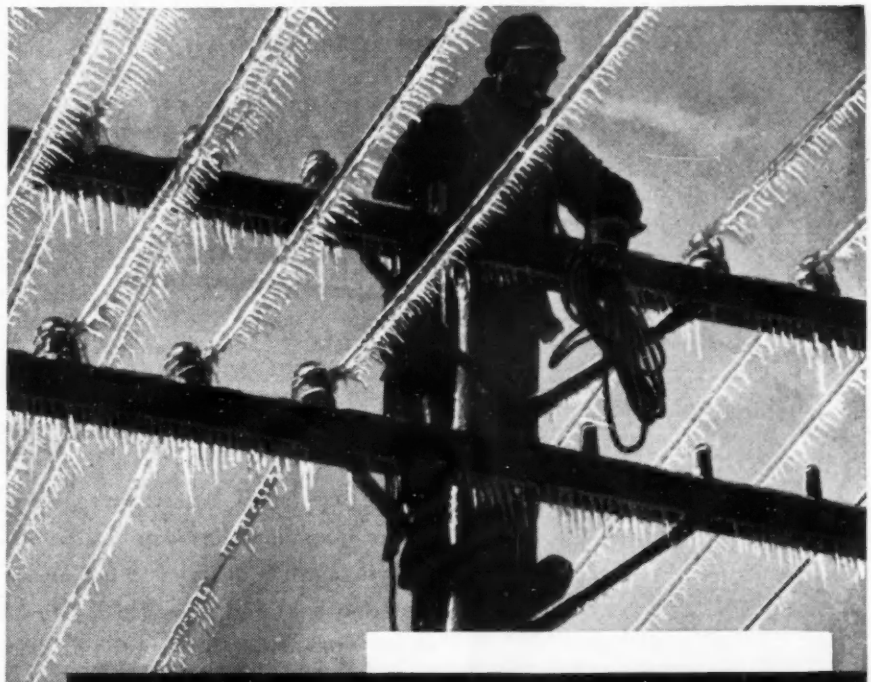
(4) On 6-wheel-drive models, frame is lengthened and reinforced and a third driving axle and wheel assembly installed.

(5) Tires are replaced for increased flotation, when necessary, and special accessories added for adaptation to special operations.

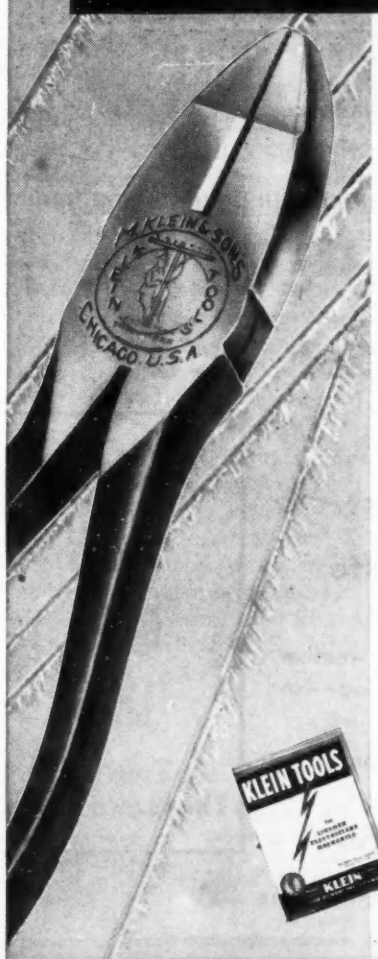
By utilizing standard Ford components, wherever possible and practical, Marmon-Herrington has taken advantage of the economies of Ford mass-production methods and has succeeded in producing the first heavy-duty All-Wheel-Drive truck ever offered in the medium price field.

Marmon-Herrington All-Wheel-Drive trucks of this new series are especially engineered and powered for types of heavy-duty service which have proved either too difficult or altogether impossible for trucks of conventional drive. With live power and traction in all wheels—front wheels pulling, rear wheels pushing—they have the tremendous tractive power needed to transport peak loads through deepest mud, sand or snow, up steepest hills and mountain grades. They are particularly suited to a wide variety of off-the-road services—oil fields and pipe-line work—mining and logging operations—telephone and power-line construction and maintenance—construction and maintenance of roads, airports, bridges, dams—snow-removal work—farming, etc.

In addition to the six "Q" Series models, the Marmon-Herrington line of All-Wheel-Drive trucks includes twelve other Ford conversions and four heavy-duty models of its own manufacture. In all, there are twenty-



KLEIN PLIERS!



... PREFERRED BY LINEMEN

Wherever there are linemen . . . whatever the job—tough or routine—you'll find Klein Pliers.

There's good reason for this widespread preference that began when the electrical industry was in its infancy and has continued on through the years.

Linemen know they can depend upon the quality and performance of Klein Pliers. Drop forged from the finest alloy steel, each pair is individually tempered and tested—has the proper balance—just the right spring to the handles to minimize hand fatigue. A fitted hinge keeps jaws perfectly aligned—the carefully matched knives cut swiftly, surely and stay keen for years.

The complete Klein line includes pliers for every use. Your supplier will fill your order as quickly as possible.

Ask Your Supplier

Foreign Distributor: International Standard Electric Corp., New York

A copy of the Klein Pocket Tool Guide, showing the Klein line and containing valuable tool information, will be sent on request.

Since 1857

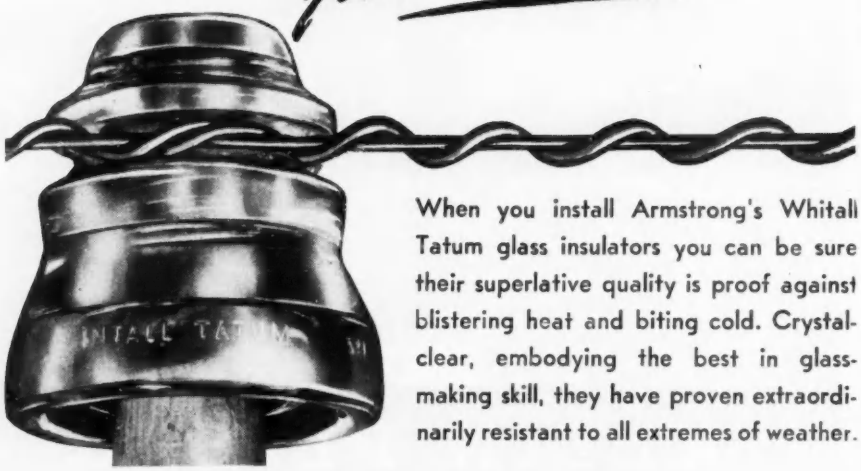
Mathias KLEIN & Sons

Established 1857 **Chicago, Ill., U.S.A.**

3200 BELMONT AVENUE, CHICAGO 18, ILLINOIS

Reduce breakage loss with . . .

Armstrong's glass insulators



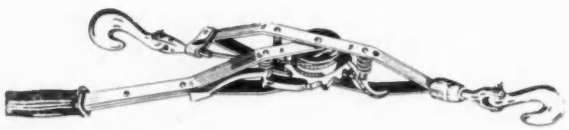
When you install Armstrong's Whitall Tatum glass insulators you can be sure their superlative quality is proof against blistering heat and biting cold. Crystal-clear, embodying the best in glass-making skill, they have proven extraordinarily resistant to all extremes of weather.

RECOMMENDED AND DISTRIBUTED BY

AUTOMATIC ELECTRIC
SALES CORPORATION

1033 W. VAN BUREN ST., CHICAGO 7, ILL.

The POW'R-PULL is a cold weather tool!



Weighs only 6 lbs. Has a safe capacity of 1500 lbs.

Light, fast, dependable—Ideal for cold weather jobs. No ropes or chains to tangle or clog—No blocks to jam.

Weighs only six pounds but handles ¾ ton. Carry on tool belt.

Guaranteed — Only $14.75 F.O.B.

Order yours today

Stretches
Hoists
Pulls
Lifts

A Tool of a Thousand Uses

SINCE 1926

TELEPHONE REPAIR & SUPPLY COMPANY

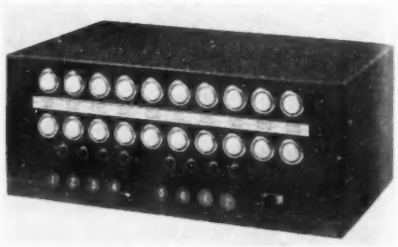
DAN'L H. McNULTY, President and Manager

1760 Lunt Avenue **Chicago 26, Illinois**

two models, with gross vehicle weights ranging from 4,700 pounds to 42,000 pounds. Altogether, there are five engines—three 6-cylinder and two V-type 8-cylinder. These vary from 95 horsepower to 145 horsepower. Thus the Marmon-Herrington line embraces an All-Wheel-Drive model for virtually every light, medium and heavy-duty need in difficult trucking operations.

Kellogg Introduces New Key-BX Telephone System

Most recent of communication products introduced by the Kellogg Switchboard & Supply Company, Chicago, is the new Kellogg Key-BX wiring plan system. This equipment, according to F. M. Parsons, sales manager,



Kellogg No. 6-2-20 Key BX Box.

provides industrial plants and offices such as in the communications field, with a specialized telephone system within their own organizations.

Designated as No. 6-2-20 System, the Key-BX incorporates a wiring plan that makes subscribers telephone service more flexible and greatly increases efficiency. For companies requiring several simultaneous outlets to the main exchange the Key-BX system is the answer to improved and efficient telephone service.

The Key-BX system is a wiring plan scheme which eliminates the necesity of floor type or cordless P.B.X. switchboards requiring an attendant to handle outgoing, incoming and intercom calls. No special attendant is needed with the Key-BX system. Each individual is his own attendant and has access to all incoming or outgoing trunks, and can call any individual in the organization conectned to the Key-BX system.

This equipment permits one to six trunks to a common battery manual or dial exchange; up to 20 telephone stations within the business office or biulding; and one or two intercom circuits for talking between individuals, or for conference calls between several individuals.

The Kellogg company is now accepting orders on Key-BX systems for

early 1949 deliveries. For additional information on the Key-BX, write the Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, for the new 14-page bulletin "Kellogg Key-BX Systems."

Federal Develops Line of Automatic PBX's

A complete line of new private automatic branch exchanges (PABX's) offering compact and economical intercommunicating dial telephone service to meet virtually any requirement —from six lines to unlimited size— has been developed by Federal Telephone and Radio Corp., Clifton, N. J., manufacturing associate of International Telephone & Telegraph Corp. Included in Federal's line are the following PABX's; 6E; 11P; 25C; 35 type; 7J; and step by step.

Federal states the equipment can be simply and economically installed, and provides—in addition to dial intercommunication between local stations —such features as incoming and outgoing calls from any station; consultation call from any station while "holding" a call trunk; trunk transfer; and partial or complete restriction for any station, plus complete secrecy of all conversations and immediate 24-hour service without the attention of an operator.

There is a Federal PABX to provide convenient dial telephone service for every office, residence or business in which intercommunication is either necessary or desirable. For the small office or large residence the 6E PABX, providing two central office trunks, six local stations and one local link, may be employed. This unit, which weighs only 60 pounds and is 18" high, by 8" deep, by 18" wide, can be arranged for wall mounting and has an easily removable dust cover and hinged relay gate for easy access to all components and wiring.

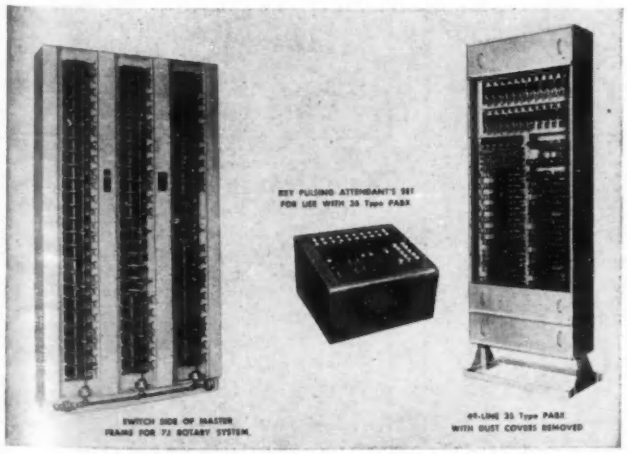
The medium sized business or institution, requiring a greater capacity, will find the 11P PABX more suitable. This unit, which provides three central office trunks, 10 local stations, and two local links, weighs 85 pounds and is contained in a cabinet—which can be wall mounted—26" high, by 21" wide, by 9" deep.

Automatic dial intercommunication for office building and industrial plants can be obtained through the use of Federal's 25C PABX which provides five central office trunks, 25 local stations, and three local links. This equipment is compactly mounted on a vertical rack 7' high, by 21" wide, by 20" deep. Removable dust covers on both sides of the rack enclose all wiring and components, yet permit easy access for maintenance.

The 35 type PABX, available in 49 and 99 line capacities, is designed for large office building, stores, factories, and institutions. This equipment can provide 10 central office trunks, and either 49 local stations and 6 local links, or 99 local stations and 12 local links. The 49 line unit is housed in a rack 8¾' high, by 38¼"wide, by 19¾" deep, while the 99 line unit is contained in two racks each 7¼' high, by 38¼" wide by 19¾" deep. Racks are fully enclosed by dust-tight paneling with removable cover for access to wiring and components.

A new and faster method of distributing trunk calls has been incorporated in the 35 type PABX through the use of Federal's exclusive Key Pulsing Attendant Set. This set permits the attendant to connect a call to any local station by a simple key and push-button operation—much faster than dialing or cord plug-in and manual ringing.

Where over 100 local stations are required Federal's 7J PABX can be employed. This unit, which is similar to the 7J rotary system, can be designed for any desired link and line capacity. Equipment is mounted in one or more master frames, each measuring 8' 6½" high, by 56" wide, by 26" deep.


KEY PULSING ATTENDANT'S SET FOR USE WITH 35 Type PABX
SWITCH SIDE OF MASTER FRAME FOR 7J ROTARY SYSTEM
49-LINE 35 Type PABX WITH DUST COVERS REMOVED

Shown in this photograph are the Federal 35-Type PABX with Key Attendant Set and Federal 7J PABX.

The torchlight telegraph of Polybius

IT TOOK a "communications expert" plus two nimble operators to spell out a message on this unusual semaphore, used by the Greeks around 200 B.C.

Brainchild of an historian named Polybius, this system was limited to short distances. Nevertheless, it represented one of the first types of coded communication.

Nowadays, messages streak over distances unimaginable to the ancients. On guard over many telephone and telegraph lines are Hemingray Insulators, contributing greatly to overall efficiency.

Hemingray No. 56

★

This advertisement is one of the Hemingray series on the history of communication.

HEMINGRAY INSULATORS

American Structural Products Company

MUNCIE, INDIANA

Subsidiary of **Owens-Illinois Glass Company**

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For the Convenience of readers of Telephone Engineer

Cedar Poles
MAC GILLIS & GIBBS COMPANY
Wells Bldg. Milwaukee 2, Wis.
★ ★
Northern White and Western Red Cedar Poles—Plain or Butt-Treated

CYRUS G. HILL
ENGINEERS
ALLEN K. HAMILTON
Plant—Traffic—Commercial
Valuations and Original Cost
231 S. LaSalle St., Chicago 4

RECONDITIONED EQUIPMENT
Kellogg No. 801 Steel Wall Sets, Common Battery, Any type Ringers, at $8.00.
Kellogg No. 118 Stands, No. 600 type Ringer Boxes, complete desk sets, Common Batt., at $8.00.
Kellogg No. 118 or 84 type stands, complete at $5.00.
Brand New, W. E. No. 47 Plugs, at 50c each.
INDEPENDENT TELEPHONE REPAIR CO.
1432 West Fifteenth St. Chicago 8, Ill.

SPECIALISTS • Our 42nd. Year
TELEPHONE FORMS
PRINTING • PLANOGRAPHING
YOUR ORDERS RECEIVE PROMPT ATTENTION
CULLOM & GHERTNER CO.
309 5th AVE., N. NASHVILLE 3, TENN.

SLOAN, COOK & LOWE
CONSULTING ENGINEERS
Suite 1344 120 South LaSalle Street
CHICAGO
Appraisals—Original Cost Studies
Depreciation, Financial, and Other Investigations

TELEPHONE FUSES REPAIRED
Save 20-50 Per Cent—Prompt Delivery

Cook A9-12	$.08	W.E. 35 Indicator	$.10
Cook A7-46	.07	A.E. Indicator	.08
R.E. Co. 44-52	52.10	W.E. 11C	.10
W.E. 11D-12A	.15	W.E. 7A-7T	.12

We buy fuses good or blown
TELEPHONE REPAIR SERVICE
Box 342 Williamsport, Pennsylvania

Chemical Dehydrators
Automatically controlled, using flake calcium chloride for preventing dampness and condensation in automatic totally enclosed telephone exchanges.
The H. J. Kaufman Co.
13215 Roselawn Ave., Detroit 4, Mich.

JAY G. MITCHELL
Public Utility
Operating and Management
Economics
P. O. Box 523 Evanston, Ill.

CLASSIFIED ADS

Help Wanted

Combination Men & Installers Needed

Independent Company with 50 exchanges in **Eastern Washington, Northern Idaho, Western Montana,** needs **experienced** installers and combination men **between the ages of 25 and 45.** Company located in best section of diversified area of Pacific Northwest.

Mild climate, magnificent scenery, abundant game and fish area. This company noted for fair treatment of employees. Vacations with pay, insurance, sick leave benefits, holidays with pay for permanent employees and generous pension plan. Good wages. Overtime after 8 hours per day and after 40 hours per week. Please give as much information as you can first letter stating age and experience. Send photo if possible. Box No. 8605 c/o Telephone Engineer.

HELP WANTED: Plant Superintendent for operating group in Eastern Pennsylvania. In your reply, please state qualifications, age, necessary wage, and if possible attach a small photograph. Write Telephone Engineer Box No. 8599.

HELP WANTED: Combination man wanted able to maintain C.B. and magneto plant of 1500 stations. Wages $300 to $500 for qualified man. Address K. P. Ellefson, Waverly, Minn. or telephone Waverly 2931. Also want man and wife combination to operate and maintain exchange of 200 stations. Living quarters provided. Or can use just agent.

Help Wanted

HELP WANTED: Young or middle age man experienced in telephone or electrical work. Steady position with opportunity for future. Write details of experience. H. R. Wolle, Minnesota Lake, Minnesota.

HELP WANTED: Experienced telephone lineman at once. Central Telephone Company, Clear Lake, South Dakota.

HELP WANTED: Cableman and Linemen by Midwestern Class A telephone company. Opportunity for permanent employment and good wages. Give age, experience, etc. Write Box No. 8608 c/o Telephone Engineer.

For Sale

FOR SALE: 300 line Kellogg magneto switchboard equipped with 15 keys on each position; 245 combination shutter type jacks and drops and protectors; also a Leich straight line ringer just as it came out of service. Make us a bid. Cox & Warner, Cookeville, Tennessee.

FOR SALE. Automatic Electric Monotype Desk Stands and Bell Boxes.
Government Surplus Drop Wire $25.00 per ½ m. reel.
B. Type—Pony 10 pin Crossarms 5 Circuit Protectors for Crossarm mounting.
One 31 D C Nicopress and Sleeves. Nicoma Park Telephone Co., Nicoma Park, Oklahoma.

FOR SALE: 1400 Western Electric wall common battery telephones, metal boxes, Harmonic ringers. 390 Western Electric common battery metal ringer boxes, Harmonic ringers. This equipment just removed from service and in working condition. Offers invited F.O.B. shipping point for the complete lot or partial lot. Write Box No. 8606 c/o Telephone Engineer.

For Sale

CABLE FOR SALE:

8,000 ft. (2 reels) 7 quad. 19 ga. jute & lead covered telephone cable

351 ft. 156 quad. 22 ga. lead covered telephone cable

410 ft. 18 quad. 16 ga.-37 quad. 19 ga.-1 quad. 22 ga. lead covered telephone cable.

473 ft. 303 pr. 22 ga. & 202 pr. 19 ga. lead covered telephone cable

8192 ft. 51 pr. 19 ga. lead submarine cable on 8 reels—(3-2000 ft.; 1-1849 ft.; 1-110 ft.; 1-77 ft.; 1-70 ft.; 1-66 ft.)

1564 ft. 1 pr. 19 ga. jute rubber cable.

For prices and location write Box No. 8607, c/o Telephone Engineer.

DO YOU NEED "KNOW HOW" for a better job . . . do you want to catch up on developments in telephony today? For the answers to questions in general and your problems in particular, we recommend highly the books listed in this issue of TELEPHONE ENGINEER & MANAGEMENT.

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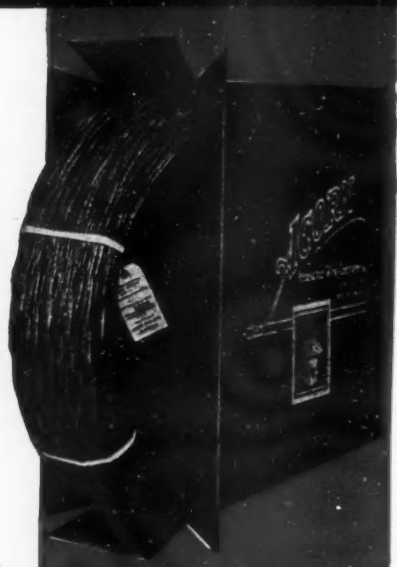

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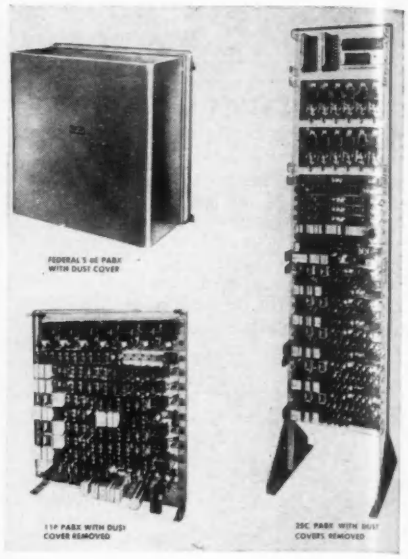

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The step by step PABX is also adaptable to any condition where 100 or more lines are required.

Federal, established in its new modern building at Clifton, New Jersey, is now in full production on the entire PABX line and deliveries can be made in a matter of weeks on the smaller units. Interesting delivery dates also can be given for the larger equipment.

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ONAN ELECTRIC PLANTS

Motorola Announces Organization Changes

Following the recent appointment of Robert W. Galvin as executive vice president of Motorola Inc., Paul V. Galvin, president, has announced that he has named Walter H. Stellner vice president of merchandising and Elmer H. Wavering vice president of product design. Mr. Stellner was formerly vice president in charge of home radio and television set design and Mr. Wavering was vice president in charge of automotive product design.

Under the new organizational structure, Mr. Wavering will be responsible for consumer product engineering; home radios, auto radios, television sets and car heaters. Mr. Stellner will supervise all merchandising, including sales, advertising, market research, and service.

"The new staff structure re-organization will result in a horizontal rather than a vertical company structure", Paul V. Galvin pointed out. "It will apply to the consumer durable goods end of our business. The object of these changes is to strengthen our organization at the staff level. It does not apply to the Communications and Electronics Division", he added.

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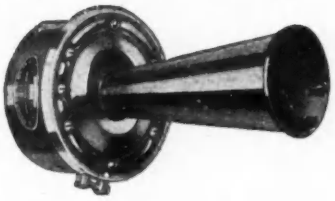

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In garages, elevators, factories, and similar locations where an out-of-the ordinary "ring" is required, the Benjamin Howler in place of bells will really do the job.

Have you such a problem?

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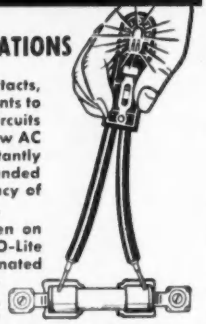

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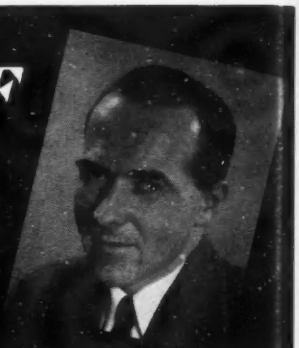


By JOHN G. REYNOLDS
Managing Editor

The Country Party Line . . . A man from Joplin, Mo., is suing the Southwestern Bell Telephone Co. because, he alleges, a telephone operator listened in on his conversation and repeated it, thus getting him in trouble with his wife. This is a city problem. It could never have arisen on the old country party line. On the party line everyone expected that his neighbors would listen in, and he never discussed anything secret. In turn, others listened in without intending to eavesdrop.

Before the day of the radio, the hardsurface country road and the automobile, a telephone line was the farmer's link with his neighbors and the outside world. Every telephone had a distinctive ring. The Hansens' ring was four longs; the Knudsens' was three longs; the Thompsons' was one long and three shorts, and so on. When Mrs. Hansen called Mrs. Thompson, she would go to the box telephone on the wall, under the old clock, take down the receiver and crank one long and three shorts. This would ring in every farm house on the line. Farm people got so accustomed to the system that when they were sleeping their own ring would wake them up but not the ring of somebody else.

• • •

Items You May Have Missed . . . Mrs. Thomas Murdon of Comington, England, has been cleaning the village's public telephone booth daily for 10 years for one shilling (20 cents) per week. Now the government wants half of that—sixpence (one dime) under national health insurance plan. She's thinking of quitting. . . . Old saying about 'death & taxes' took a new twist in the case of Giovanni Villa, 35, of Palermo, Sicily. Villa has been trying for four years to have himself declared alive. He has succeeded only with tax collector who sends him bills. Palermo civil registry has him listed as dead since 1944 at the village of Patricia, which Villa said he never visited. His wife recently had a baby. He tried in vain to have the child registered but officials said, "Dead men can't father children." Villa, however, gets and pays all tax bills.

• • •

Busy Man . . . Ralph Emerson Heile may not be the busiest man in the world but he figures he has as good a claim as anyone to the title.

He is president of the Pymatuning Independent Telephone Co., Transfer, Pa., one of its part-time linemen, and works a regular eight-hour trick at the Westinghouse Electric Corp. plant in Sharon, Pa.

In addition, he raises Christmas trees for sale and in his "spare time" tends a sizable vegetable garden.

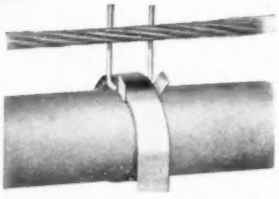
"My job of wireman at Westinghouse is the only one which requires a full eight hours every working day," he explains. "As telephone company president my duties can be fitted in during afternoons and evenings and on week-ends. I'll admit, though, that spare time is kind of scarce."

Heile has been president of the Pymatuning company for five years but he draws his pay for being a lineman. "The job of president carries no salary," he said. "I stick with the executive job because I like the work."

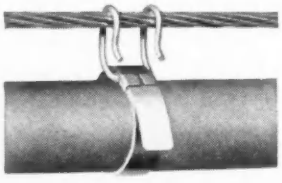
"JOB PROVEN"

By Linemen The Country Over

NICOPRESS Tool for Compressing Sleeves

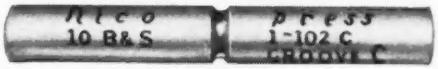


National Adjust-A-Strap, partially installed. Notice split buckle to facilitate wrapping zinc strap around cable



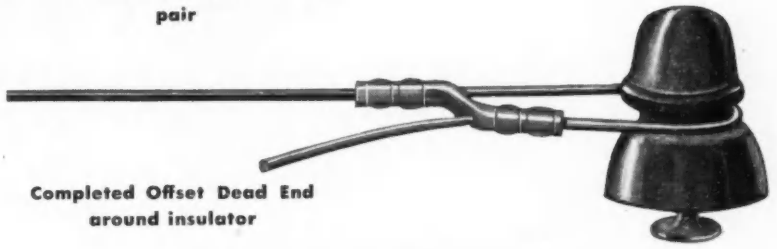
National Zinc-Wrap partially installed

Ask Your Jobber



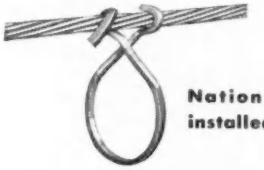
NICOPRESS line wire Splicing Sleeve

NICOPRESS splices on twisted pair



Completed Offset Dead End around insulator

NICOPRESS Reducing Sleeve splice on wires of different sizes (before compressing)



National cable ring installed on messenger

NICOPRESS Repair Sleeve used to replace defective old style joints

NICOTAP—Split feature permits easy installation on line wire.

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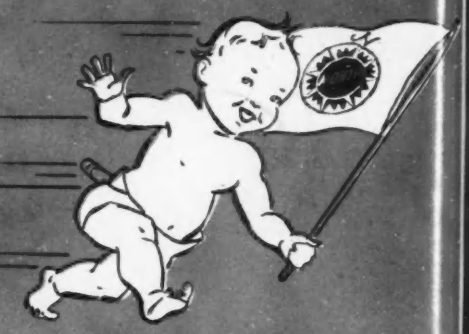

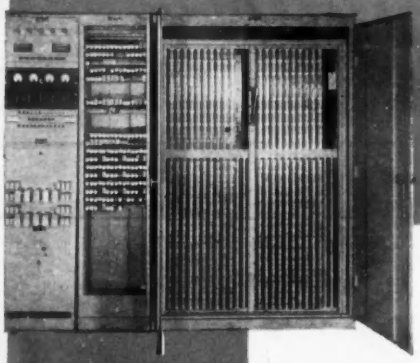

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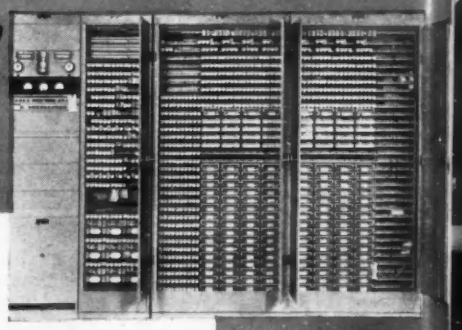

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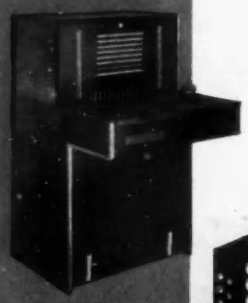

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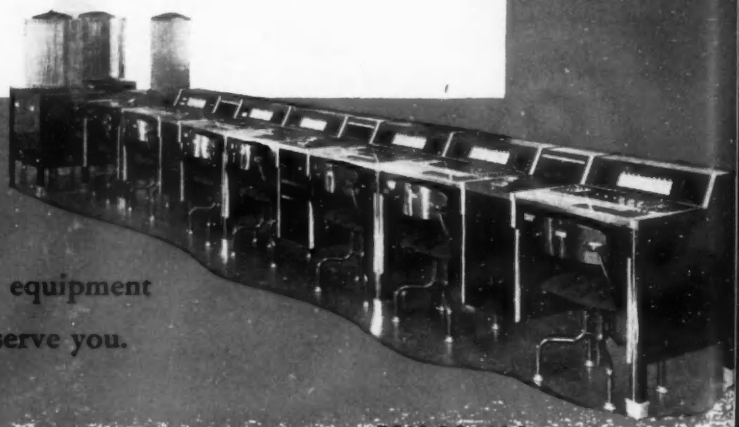

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